

**REPORT**

EPA Region 5 Records Ctr.



348829

**First Quarter Vapor Intrusion  
Investigation Report  
North Bronson Industrial Area  
Operable Unit 1  
Bronson, Michigan**

**NBIA OUI PRP Group**

**June 2008**

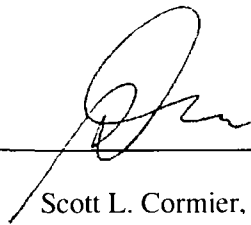


**O'BRIEN & GERE**

# REPORT

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North Bronson Industrial Area  
Operable Unit 1  
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***NBIA OUI PRP Group***



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June 2008



**O'BRIEN & GERE**

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## **1.0. Introduction**

The North Bronson Industrial Area (NBIA) Site Operable Unit 1 (OU1) Potentially Responsible Parties (PRP Group) retained O'Brien & Gere to implement the Vapor Intrusion Work Plan (O'Brien & Gere, 2007) for OU1 at the NBIA Site. This Work Plan was approved by the United States Environmental Protection Agency (USEPA) via letter dated September 4, 2007, and was subsequently modified in accordance with correspondence between the PRP Group and USEPA dated January 16, 2008. The work completed during this portion of the Vapor Intrusion Study was conducted in accordance with the approved Work Plan, except as noted in this report.

### **1.1. Purpose and objectives**

The purpose of the Vapor Intrusion Study is to aid in evaluating the vapor intrusion potential attributable to NBIA OU1 impacted ground water, with the goal of identifying whether nearby residential, commercial, or industrial structures may be affected by vapor intrusion. The purpose of this report is to communicate the activities associated with the first quarter of the four-quarter program of soil gas sampling, laboratory analysis, and data management. Descriptions of the site, site background, geology and hydrogeology, and ground water flow and quality characteristics were provided in the Work Plan. Further discussion of these topics is provided in this report only to the extent they pertain to the soil gas sampling activities described herein.

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## 2.0. Soil vapor program activities

The objective of this task was to evaluate the potential presence of constituents of concern (COCs) in soil gas proximal to the Western Lagoon Area (WLA). To accomplish this objective, discrete subsurface soil gas samples were collected for laboratory analysis of select volatile organic compounds (VOCs) from five locations (*i.e.*, SG-8 through SG-12), as shown in Figure 2. The locations of the vapor probes were adjusted slightly from the proposed locations to relocate them along tree lines to protect them from damage and to place SG-8 on higher ground due to the high water table. These locations provide information regarding the potential presence of soil vapor migration in the vicinity of the WLA to the east, south, and west and are designed to identify the potential for soil vapor intrusion in the event that structures would be built near the lagoon area. County Drain #30 forms the northern perimeter of the WLA, and this incised drainageway significantly reduces the potential vapor intrusion concerns to the north by truncating the vadose zone in this area.

Soil gas sampling locations SG-8 and SG-9 (Figure 2) were strategically located between the WLA and the City of Bronson Wastewater Treatment Plant (WWTP) near the alignment of the city storm sewer that could potentially act as a preferential pathway for soil vapor migration. Compared to sampling adjacent to the WWTP, the selected locations of SG-8 and SG-9 were intended to provide more definitive information regarding the potential for soil vapors originating at the WLA to impact the main building of the WWTP. The WWTP is generally upgradient of the WLA and at a distance of at least 300 feet (Figure 2).

The following sections provide a brief summary of the activities conducted during the first quarter of the soil vapor program. A more detailed description of the procedures used during the implementation of the soil vapor program is provided in the Section A5 (Sampling Procedure Plan) of the Field Sampling and Quality Assurance Plan, Revision 2, Addendum 1 (FSQAP Addendum 1), which is included as Appendix A to the Work Plan.

The soil gas sampling program was conducted in accordance with the Health and Safety Plan, Addendum 1, contained in Appendix B of the Work Plan. Prior to initiating site activities, MISSDIG, Michigan's utility clearance hotline, was contacted to clear the proposed vapor probe locations. The proposed locations were also screened by WorkSmart, Inc. of Lawrence, Michigan, to clear the locations for buried utilities. Field activities were initiated on April 23, 2008, and the first quarter soil gas sampling event was completed on April 25, 2008.

### 2.1. Soil vapor probe installation

An initial soil boring was advanced through the unconsolidated soils to a depth of 5 feet below grade (fbg) at each of the soil vapor probe locations to collect a soil sample and to identify the depth to the ground water table. A direct push drill rig (*i.e.*, Geoprobe®) mounted on an all-terrain vehicle and direct-push soil sampling methods were used to advance these borings. Stearns Drilling Company of Dutton, Michigan provided drilling services for the soil vapor probe installation. The soils encountered during drilling at the initial boreholes were classified in the field in accordance with the standard Unified Soil Classification System (USCS) (ASTM 1990) and soil boring logs were prepared (Appendix A). Geologic descriptions included organic vapor readings collected using a flame ionization detector (FID) and the depth to water or saturated zone.

The soil vapor probe corresponding to each of these borings was then located approximately 3 feet away from the initial borehole and was advanced to a target depth no closer than 1 foot above the saturated soils. This technique facilitated the collection of soil vapor samples considered representative of potential sub-slab concentrations for buildings with basements and is a conservative estimate of sub-slab concentrations for buildings with slab-on-grade construction. The initial boreholes were filled with bentonite slurry after completion to minimize short-circuiting of ambient air into the soil vapor probes.

The soil vapor probes consisted of a 6-inch length of double-woven stainless steel wire screen with a pore diameter of 0.0057 inches (0.145 millimeters) attached to an appropriate length of Teflon<sup>®</sup> tubing. Teflon<sup>®</sup> was used in lieu of Nalgene<sup>®</sup> 489 polyethylene tubing to provide better performance (less potential for absorption) for vapor probes intended to remain in place for one year or more. The soil vapor probes were driven to the target depths using dual tube sampling rods. As the rods were removed, the annular space around the screen was packed with appropriately sized glass beads to 6-inches above the screened interval. The annular space around the tubing was sealed with approximately 1 foot of a dry granular bentonite to prevent water infiltration/infilling across the sample inlet. The remainder of the boring annular space was sealed above the sampling zone to ground surface with bentonite slurry to prevent ambient air infiltration. A flush-mounted protector casing was installed around the vapor probe to protect it from damage and tampering. Appendix B contains vapor probe construction details for the probe locations.

The locations and elevations of the new soil vapor probes will be surveyed by a licensed surveyor (using the same coordinate system used for other surveys within the NBIA) during upcoming surveying activities at the site associated with the Ground Water Delineation study. In the meantime, the locations of the soil vapor probes were established by measuring their locations relative to existing site features including fences and monitoring wells and were incorporated into the existing Site base map (Figure 2).

## 2.2. Soil Vapor probe sampling

Discrete samples of soil gas were collected from the soil probes. Prior to the collection of the soil vapor samples, the sampling tubing was purged of ambient air. A minimum of one and a maximum of three volumes of air within the sample probe and tubing were purged prior to sample collection. In addition, helium tracer gas screening was used during sampling of the five soil vapor probes to evaluate the adequacy of the sampling technique and identify potential short-circuiting from the ground surface during sample collection. The tracer gas screening and soil vapor probe sampling procedures implemented during this sampling event were consistent with the procedures provided in the Work Plan. A Dielectric Technologies Model MGD-2002 helium detector was used to screen the extracted vapor stream for helium. This detector is more sensitive than the Mark Helium Model 9822 detector specified in the Work Plan, with a sensitivity of 25 parts per million by volume (ppmv); therefore, it meets the "or equivalent" requirement of the Work Plan. No short-circuiting was observed, and the vapor probes passed this screening test. Soil gas samples were then collected over a four-hour period at each location in accordance with the Work Plan.

The soil vapor samples were submitted under routine chain-of-custody protocols to TestAmerica of Burlington, Vermont, which is a National Environmental Laboratory Accreditation Conference (NELAC) certified laboratory for analysis of the COCs (*i.e.*, trichloroethene [TCE], cis-1,2-dichloroethene, trans-1,2-dichloroethene, and vinyl chloride) by USEPA Method TO-15. Quality assurance/quality control (QA/QC) measures were implemented during the field sampling activities



including documentation of sample container vacuum/pressure before and after sample collection, chain-of-custody protocols, field (or equipment) blanks accompanying empty SUMMA canisters to the field and filled sample containers back to the laboratory, and the collection of a field duplicate sample.

### **2.3. Decontamination procedures**

In accordance with the Work Plan, the field sampling program included decontamination procedures to minimize the potential for contaminants to be introduced into the sample locations or transferred across the study area. Equipment that came into contact with soil, underwent an initial cleaning process, was cleaned between vapor probe locations to prevent cross-contamination, and was cleaned prior to leaving the study area at the conclusion of drilling activities.

### **2.4. Handling of investigation-derived waste**

Investigation-derived waste (IDW) including soils, decontamination fluids, personal protective equipment, and disposable sampling supplies resulting from the field activities were segregated and placed in new, properly labeled United States Department of Transportation (DOT)-approved 55-gallon drums. The IDW drums were staged in the WLA.

### **2.5. Sampling documentation**

The collection of soil vapor samples was documented on soil vapor sample collection field forms contained in Appendix C. The collection, transfer of custody, and shipping of the samples to the analytical laboratory were documented using chain-of-custody forms contained in Appendix D, along with the analytical reports for the first quarterly sample event.

### **2.6. Validation, management, and evaluation**

The analytical data generated during the first quarterly sampling event were validated, and the usability of the data for assessing the extent of COCs was assessed. The data validation report for the first quarterly sampling event is contained in Appendix E.

Data management procedures were established to effectively process the data generated during the investigation such that the relevant data descriptions (sample numbers, methods, procedures) are readily accessible and accurately maintained. Data were collected and recorded in a variety of ways during the sampling program. These included utilizing standard field forms, field notebooks, and laboratory generated data. The original forms and data are maintained in O'Brien & Gere's files. Data amenable to computerization, such as analytical data, were input to a data storage system.

### 3.0. Findings

The information obtained from the activities described in Section 2 is presented in the following section. Information supporting the observations and findings presented in this report is provided in the table, figures, and appendices of this report.

#### 3.1. Geology and hydrogeology

The soils encountered during the installation of the soil vapor probe borings SG-8 through SG-12 consisted of the following:

- A vegetated yellowish brown (grayish brown at SG-8), damp silty sand (*i.e.*, topsoil) (USCS SM) to a depth of 1 fbg,
- A damp, yellowish brown clayey sand (USCS SC) or sandy clay (USCS CL) to depths of between 2.0 fbg at SG-12 to 4.3 fbg at SG-8, and
- A yellowish brown to orange, moist to wet, sand with trace to some gravel (USCS SP) to the termination of the boreholes at 5 fbg. Varying amounts of silt were indicated in the sand layer at SG-12 (USCS SM to SP).

The depth to ground water on April 23, 2008 ranged from 4.0 fbg at SG-9 through SG-12 to 4.3 fbg at SG-8 (see Appendix A); therefore, the vapor probes were installed at either 3.0 fbg at SG-9 through SG-12 or 3.3 fbg at SG-8 (see Appendix B) in consultation with the USEPA, the Michigan Department of Environmental Quality (MDEQ), and NBIA OUI PRP Group. The depth to ground water was shallower than expected below grade and was likely elevated because of recent heavy rains in the area. It is expected that the water levels encountered during summer and fall sampling will be lower than the levels observed during this sampling event. Placement of the probes at the 3.0 to 3.3 fbg depths will likely maintain these sampling points above seasonal fluctuations in ground water levels.

#### 3.2. Field observations

FID readings of 0 ppmv were recorded at each of the soil borings during the installation of the soil vapor probes (see Appendix A). No significant olfactory observations were recognized during drilling or sampling, and no visual observations of potential impacts were detected during the vapor probe installation activities.

#### 3.3. Soil vapor results

The analytical results for soil vapor samples collected during the first quarterly sampling event are presented in Table 1. The analytical laboratory report for this sampling event is contained in Appendix D. TCE was the only COC detected during this sampling event. TCE was detected in the soil vapor samples at concentrations ranging from 1.7 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) at SG-9 to 1,200  $\mu\text{g}/\text{m}^3$  in the duplicate sample from SG-12. No COCs were detected in the field blank associated with this sampling event, and the duplicate sample from SG-12 was within acceptable

relative percent difference criteria. The data met the QA/QC criteria set forth in the FSQAP; therefore, no data qualifiers were necessary for this data set, and the data set is considered 100% usable (see Appendix E).

### 3.4. Data evaluation

Table 1 also provides the MDEQ Acceptable Soil Gas Screening Concentrations (ASGSCs) for both residential and industrial criteria for both the DEEP 5' and SUB-SLAB exposure scenarios. The TCE concentrations determined at all five soil gas probes around the WLA are below the industrial criteria for both exposure scenarios and below the residential DEEP 5' criteria. The TCE results at SG-10 and SG-12, located just south and west respectively of the WLA, exceeded the residential SUB-SLAB scenario ASGSC of  $700 \mu\text{g}/\text{m}^3$  with concentrations of  $1,100 \mu\text{g}/\text{m}^3$  ( $1,200 \mu\text{g}/\text{m}^3$  in the associated duplicate sample for SG-12).

The existing vapor probes will be re-sampled during the next sampling event currently scheduled to occur in July 2008 to evaluate whether transient and environmental influences significantly affect subsurface COC concentrations

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## 4.0. References

ARCADIS Geraghty & Miller, Inc. (ARCADIS). 2002a. *Draft Phase II Pre-Design Studies Technical Memorandum*. North Bronson Industrial Area. Operable Unit 1. December 4, 2002.

ARCADIS. 2002b. *Pre-Design Studies Report (Revision 2)*. North Bronson Industrial Area. Operable Unit 1. March 5, 2002.

ARCADIS. 2005. *Groundwater Quality Investigation Technical Memorandum*. North Bronson Industrial Area. Operable Unit 1. April 13, 2005.

MDEQ. 1998. *Part 201 Generic Ground Water and Soil Volatilization to Indoor Air Inhalation Criteria: Technical Support Document*. Environmental Response Division. August 31, 1998.

MDEQ. 2006. *Peer Draft Review Operational Memorandum No. 4, Attachment 4 – Soil Gas and Indoor Air*. Remediation and Redevelopment Division (RRD). February, 2006.

O'Brien & Gere. 2007. *Vapor Intrusion Work Plan*. North Bronson Industrial Area. Operable Unit 1. August, 2007.

USEPA. 1998. *EPA Superfund Record of Decision (EPA/ROD/R05-98/024)*. North Bronson Industrial Area. EPA ID: MID005480900. OU 01. Bronson, Michigan. June 19, 1998.

USEPA. 1999. *North Bronson Industrial Area Site Consent Decree*. March 12, 1999.

USEPA. 2002. *Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils*. Office of Solid Waste and Emergency Response. Washington, D.C. USEPA 530-F-02-052.

## ***TABLES***

**Table 1**  
**Soil Vapor Sample Results**  
**Western Lagoon Area**  
**North Bronson Industrial Area Site**

Compound	Criteria				Western Lagoon						
	DEEP 5' Residential ASGSCs	SUB-SLAB Residential ASGSCs	DEEP 5' Industrial ASGSCs	SUB-SLAB Industrial ASGSCs	SG-8 2.8-3.3'	SG-9 2.5-3.0'	SG-10 2.5-3.0'	SG-11 2.5-3.0'	SG-12 2.5-3.0'	SG-12 2.5-3.0' (Dup-1)	Field Blank (FB-1)
cis-1,2-Dichloroethylene	18,000	1,800	26,000	2,600	2.0 U	0.79 U	4.4 U	0.79 U	5.2 U	4.8 U	0.79 U
trans-1,2-Dichloroethylene	37,000	3,700	50,000	5,000	2.0 U	0.79 U	4.4 U	0.79 U	5.2 U	4.8 U	0.79 U
Trichloroethylene	7,000	700	29,000	2,900	400	1.7	1,100	46	1,100	1,200	1.1 U
Vinyl Chloride	2,800	280	12,000	1,200	1.3 U	0.51 U	2.8 U	0.51 U	3.3 U	3.1 U	0.51 U

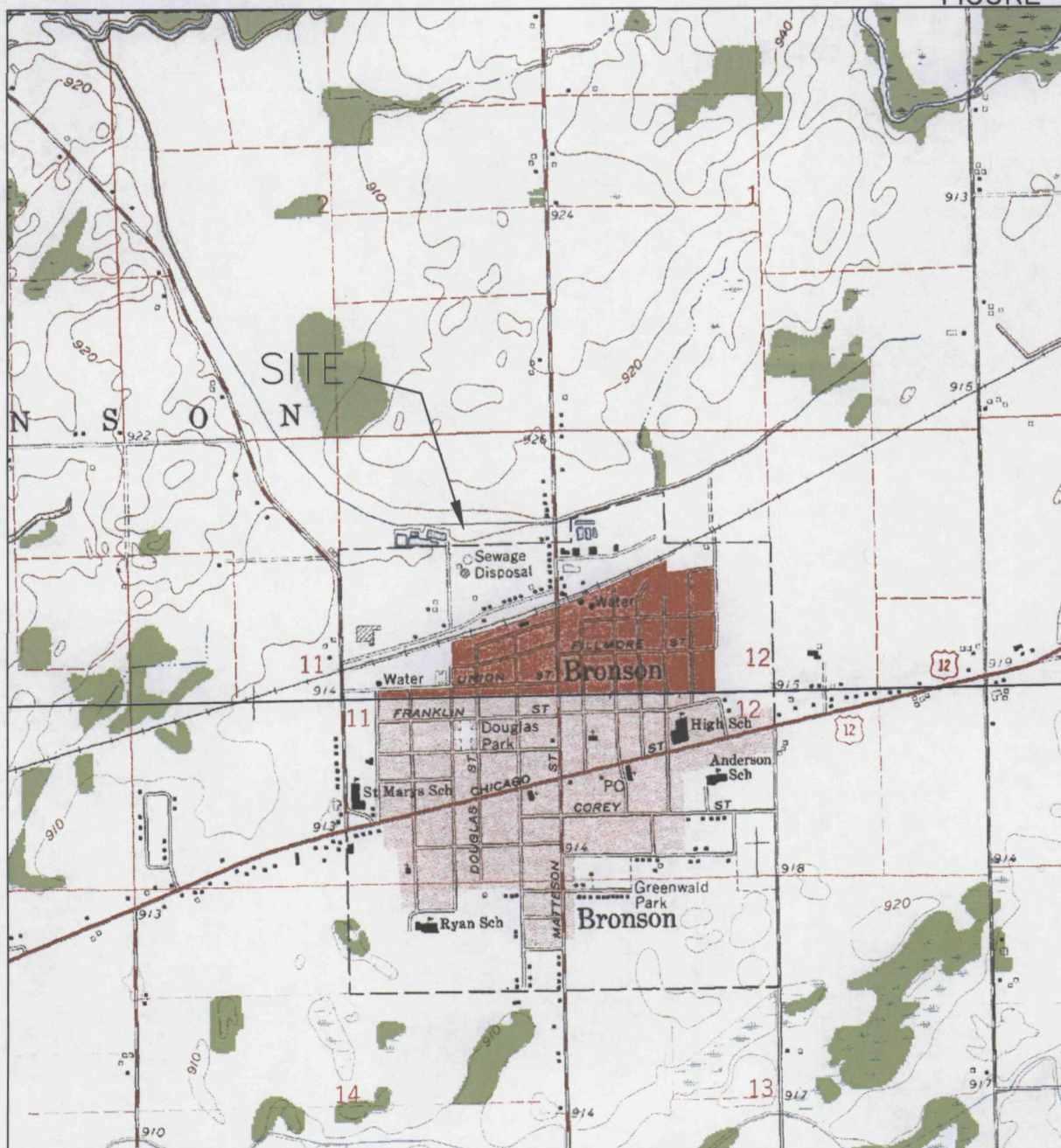
**Notes:**

1. See laboratory data reports for analytical methods and quality control data.
2. All concentrations reported in units of  $\mu\text{g}/\text{m}^3$ .
3. For clarity, all detections are shown in **bold-face type**.
4. Concentrations exceeding the Deep 5' Residential ASGSCs are shaded and concentrations exceeding the SUB-SLAB Residential ASGSCs are italicized. Source: MDEQ, 2006. Peer Draft Review Operational Memorandum No. 4, Attachment 4 - Soil Gas and Indoor Air - Appendix D. Remediation and Redevelopment Division (RRD), February, 2006.
5. Organic data qualifiers:  
 U - not detected at indicated detection limit.  
 J - concentration qualified as estimated.

## ***FIGURES***



FIGURE 1

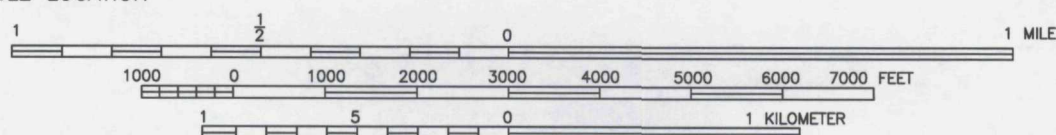


ADAPTED FROM: BRONSON NORTH AND BRONSON SOUTH, MICHIGAN U.S.G.S 7.5 MIN QUAD

# NORTH BRONSON INDUSTRIAL AREA

BRONSON, MICHIGAN

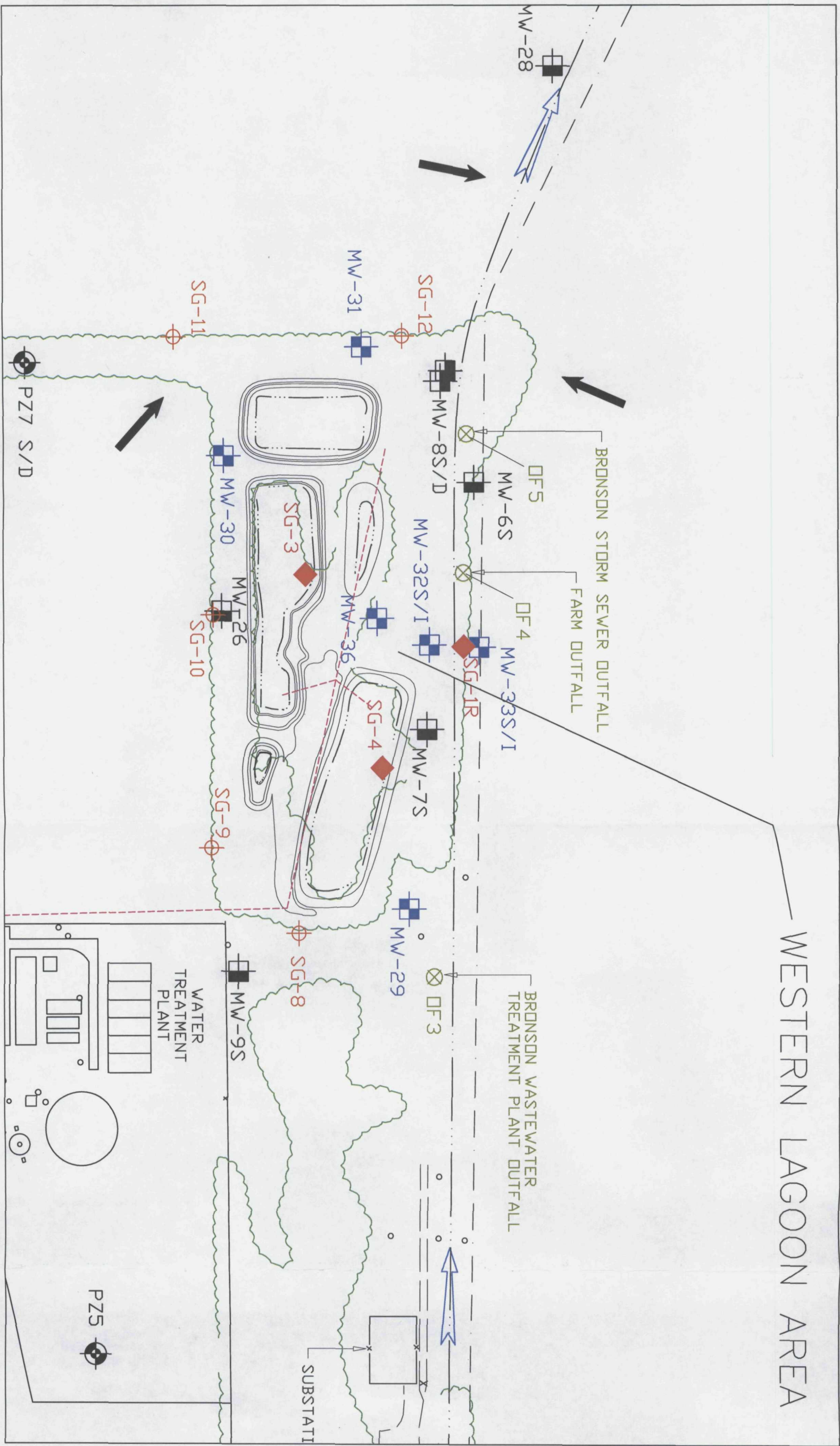
## SITE LOCATION MAP



FILE NO. 12716.38091  
AUGUST 2007

SCALE: 1:24000





- NOTES:
1. SITE LAYOUT AND EXISTING SAMPLING LOCATIONS BASED ON ARCADIS SITE LAYOUT, ARCADIS, MARCH 3, 2005, PROJ. NO. SF 002075.001
  2. LOCATION OF "INDUSTRIAL SEWER" IS APPROXIMATE AND BASED ON FIGURE 2 OF THE CONSENT DECREE STATEMENT OF WORK.

FIGURE 2

- LEGEND
- APPROXIMATE SITE BOUNDARY
  - STAFF GAUGE
  - PRE-RI
  - RI
  - PRE-DESIGN MW
  - MONITORING WELL - BRONSON PRECISION PRODUCT
  - MONITORING WELL - HALEY AND ALDRICH
  - PIEZOMETER LOCATION AND NUMBER
  - PRIVATE WELL LOCATION AND NUMBER
  - OUTFALL LOCATION AND NUMBER
  - SURFACE-WATER FLOW DIRECTION
  - GENERAL GROUND WATER FLOW DIRECTION
  - SOIL GAS SAMPLE LOCATION (SG)
  - RESIDENTIAL STRUCTURE WITHIN WESTERN LAGOON AREA STUDY AREA
  - APPROXIMATE INDUSTRIAL SEWER

NORTH BRONSON INDUSTRIAL AREA SITE OPERABLE UNIT 1 BRONSON, MICHIGAN

SOIL GAS (VAPOR) SAMPLING LOCATIONS









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JUNE 2008












## ***APPENDIX A***























### ***Soil Boring Logs***

 <b>O'BRIEN &amp; GERE</b> ENGINEERS, INC.				SOIL BORING LOG		BORING I.D.: SG-8	
<b>CLIENT:</b> NBIA OU1 PRP Group <b>PROJECT NAME:</b> VI Study <b>PROJECT LOCATION:</b> Bronson, Michigan <b>FILE NO.:</b> 12716/41686#4				<b>Boring Location:</b> East side of WLA <b>Drilling equipment:</b> Geoprobe 6600 ATV <b>Sampling equipment:</b> Stainless steel macro-core sampler, 5 ft by 2" dia. <b>Borehole Diameter:</b> 2.5 inches <b>Total Depth:</b> 5 feet below grade		<b>PAGE</b> 1 <b>OF</b> 1 <b>Surface Elevation (ft MSL):</b> <b>Top of Casing Elevation (ft MSL):</b> <b>Northing:</b> <b>Easting:</b> <b>Depth to ground water: 4'</b>	
<b>BORING COMPANY:</b> Stearns Drilling Co. <b>FOREMAN:</b> Mike Hefferan <b>OBG GEOLOGIST:</b> Kevin Schneider				<b>Start date:</b> 4/23/2008 <b>Completion date:</b> 4/23/2008		<b>LEGEND:</b> <div style="display: flex; justify-content: space-between;"> <div>  Bentonite Slurry   Granular Bentonite   Sand Pack (Glass Beads) </div> <div>  Screen   Riser </div> </div>	
DEPTH BELOW GRADE	CORE INTERVAL (ft bg)	PENETR/ RECOVERY (ft bg)	Analytical Sample Interval (ft bg)	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIP	Equipment Installed	Field Testing
							FID Headspace
0	0 - 5	3.5'	5'	Vegetation at surface, grayish brown 5YR 3/2, damp, silty SAND	(SM)		
1				Dark yellowish brown 10YR 4/2, damp, sandy CLAY	1' (CL)		0.0
2							0.0
3				Dark yellowish brown 10YR 4/2, moist, clayey SAND, trace gravel	3' (SC)		0.0
4				Moderate yellowish brown 10YR 5/4, wet, well graded SAND, little gravel	4.3' (SP)		0.0
5				End of Boring at 5 fbg	5'		0.0
6							
7							
8							
9							
10							
11							
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


















**Notes:**  
1. Subsequent to soil sampling activities the initial borehole was backfilled with bentonite.  
2. 5 ft hydraulic probe macro core sampler used, therefore no blow counts.  
3. The depth to water in the initial borehole was at 4.3 fbg.  
4. A soil vapor point was subsequently installed adjacent to the initial borehole location. The probe point was set at 2.8-3.3 fbg and completed as a flush mount.

 <b>O'BRIEN &amp; GERE</b> ENGINEERS, INC.				SOIL BORING LOG		BORING I.D.: SG-9	
CLIENT: NBIA OU1 PRP Group PROJECT NAME: VI Study PROJECT LOCATION: Bronson, Michigan FILE NO.: 12716/41686#4				Boring Location: Southeast side of WLA		PAGE 1 OF 1 Surface Elevation (ft MSL): Top of Casing Elevation (ft MSL): Northing: Easting: Depth to ground water: 4'	
BORING COMPANY: Stearns Drilling Co. FOREMAN: Mike Hefferan OBG GEOLOGIST: Kevin Schneider				Drilling equipment: Geoprobe 6600 ATV Sampling equipment: Stainless steel macro-core sampler, 5 ft by 2" dia. Borehole Diameter: 2.5 inches Total Depth: 5 feet below grade Start date: 4/23/2008 Completion date: 4/23/2008		LEGEND:  Bentonite Slurry  Screen  Granular Bentonite  Riser  Sand Pack (Glass Beads)	
DEPTH BELOW GRADE	CORE INTERVAL (ft bg)	PENETR/ RECOVERY (ft bg)	Analytical Sample Interval (ft bg)	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIP	Equipment Installed	Field Testing
							FID Headspace
0	0 - 5	4'	5'	Vegetation at surface, dark yellowish brown 10YR 4/2, damp silty SAND	(SM)		0.0
1				Moderate yellowish brown 10YR 5/4, damp silty CLAY, medium plasticity, trace roots	1' (CL)		0.0
2				Moderate yellowish brown 10YR 5/4, damp, fine SAND	2.5' (SP)		0.0
3				Dark yellowish orange 10YR 6/6, moist, fine SAND	(SP)		0.0
4				Grayish orange 10YR 7/4, wet, well graded SAND, little gravel	4.0' (SP)		0.0
5				End of Boring at 5 fbg	5'		
6							
7							
8							
9							
10							
11							
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13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							

Notes:  
 1. Subsequent to soil sampling activities the initial borehole was backfilled with bentonite.  
 2. 5 ft hydraulic probe macro core sampler used, therefore no blow counts.  
 3. The depth to water in the initial borehole was at 4.0 fbg.  
 4. A soil vapor point was subsequently installed adjacent to the initial borehole location. The probe point was set at 2.5-3 fbg and completed as a flush mount.

































 <b>O'BRIEN &amp; GERE</b> ENGINEERS, INC.				SOIL BORING LOG		BORING I.D.: SG-10													
CLIENT: NBIA OU1 PRP Group PROJECT NAME: VI Study PROJECT LOCATION: Bronson, Michigan FILE NO.: 12716/41686#4				Boring Location: South side of WLA		PAGE 1 OF 1 Surface Elevation (ft MSL): Top of Casing Elevation (ft MSL): Northing: Easting: Depth to ground water: 4'													
BORING COMPANY: Stearns Drilling Co. FOREMAN: Mike Hefferan OBG GEOLOGIST: Kevin Schneider				Drilling equipment: Geoprobe 6600 ATV Sampling equipment: Stainless steel macro-core sampler, 5 ft by 2" dia. Borehole Diameter: 2.5 inches Total Depth: 5 feet below grade Start date: 4/23/2008 Completion date: 4/23/2008		LEGEND: <table border="1"> <tr> <td></td> <td>Bentonite Slurry</td> <td></td> <td>Screen</td> </tr> <tr> <td></td> <td>Granular Bentonite</td> <td></td> <td>Riser</td> </tr> <tr> <td></td> <td>Sand Pack (Glass Beads)</td> <td></td> <td></td> </tr> </table>			Bentonite Slurry		Screen		Granular Bentonite		Riser		Sand Pack (Glass Beads)		
	Bentonite Slurry		Screen																
	Granular Bentonite		Riser																
	Sand Pack (Glass Beads)																		
DEPTH BELOW GRADE	CORE INTERVAL (ft bfg)	PENETR/ RECOVERY (ft bfg)	Analytical Sample Interval (ft bfg)	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIP	Equipment Installed	Field Testing												
							FID Headspace												
0	0 - 5	4'	5'	Dark yellowish brown 10YR 4/2, damp silty SAND	(SM)		0.0												
1				Moderate yellowish brown 10YR 5/4, damp clayey SAND	1' (SC)		0.0												
2							0.0												
3				Same as above, trace gravel	3.8'		0.0												
4				Dark yellowish orange 10YR 6/6, wet, well graded SAND, some gravel	4.0' (SP)		0.0												
5				End of Boring at 5 fbg	5'		0.0												
6																			
7																			
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Notes:  
 1. Subsequent to soil sampling activities the initial borehole was backfilled with bentonite.  
 2. 5 ft hydraulic probe macro core sampler used, therefore no blow counts.  
 3. The depth to water in the initial borehole was at 4.0 fbg.  
 4. A soil vapor point was subsequently installed adjacent to the initial borehole location. The probe point was set at 2.5-3 fbg and completed as a flush mount.

 <b>O'BRIEN &amp; GERE</b> ENGINEERS, INC.				SOIL BORING LOG		BORING I.D.: SG-11													
CLIENT: NBIA OU1 PRP Group PROJECT NAME: VI Study PROJECT LOCATION: Bronson, Michigan FILE NO.: 12716/41686#4				Boring Location: Southwest side of WLA		PAGE 1 OF 1 Surface Elevation (ft MSL): Top of Casing Elevation (ft MSL): Northing: Easting: Depth to ground water: 4'													
BORING COMPANY: Stearns Drilling Co. FOREMAN: Mike Hefferan OBG GEOLOGIST: Kevin Schneider				Drilling equipment: Geoprobe 6600 ATV Sampling equipment: Stainless steel macro-core sampler, 5 ft by 2" dia Borehole Diameter: 2.5 inches Total Depth: 5 feet below grade Start date: 4/23/2008 Completion date: 4/23/2008		LEGEND: <table border="1"> <tr> <td></td> <td>Bentonite Slurry</td> <td></td> <td>Screen</td> </tr> <tr> <td></td> <td>Granular Bentonite</td> <td></td> <td>Riser</td> </tr> <tr> <td></td> <td>Sand Pack (Glass Beads)</td> <td></td> <td></td> </tr> </table>			Bentonite Slurry		Screen		Granular Bentonite		Riser		Sand Pack (Glass Beads)		
	Bentonite Slurry		Screen																
	Granular Bentonite		Riser																
	Sand Pack (Glass Beads)																		
DEPTH BELOW GRADE	CORE INTERVAL (ft bg)	PENETR/ RECOVERY (ft bg)	Analytical Sample Interval (ft bg)	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIP	Equipment Installed	Field Testing FID Headspace												
0	0 - 5	3.5'	5'	Vegetation at surface, dark yellowish brown 10YR 4/2, damp silty SAND	(SM)		0.0												
1				Moderate yellowish brown 10YR 5/4, damp, clayey SAND	1' (SC)		0.0												
2							0.0												
3				Pale yellowish brown 10YR 6/2, moist, sandy CLAY	2.5' (CL)		0.0												
4				Dark yellowish orange 10YR 6/6, wet, well graded SAND, little gravel	4.0' (SP)		0.0												
5				End of Boring at 5 fbg	5'		0.0												
6																			
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22																			
23																			

Notes:

- Subsequent to soil sampling activities the initial borehole was backfilled with bentonite.
- 5 ft hydraulic probe macro core sampler used, therefore no blow counts.
- The depth to water in the initial borehole was at 4.0 fbg.
- A soil vapor point was subsequently installed adjacent to the initial borehole location. The probe point was set at 2.5-3 fbg and completed as a flush mount.

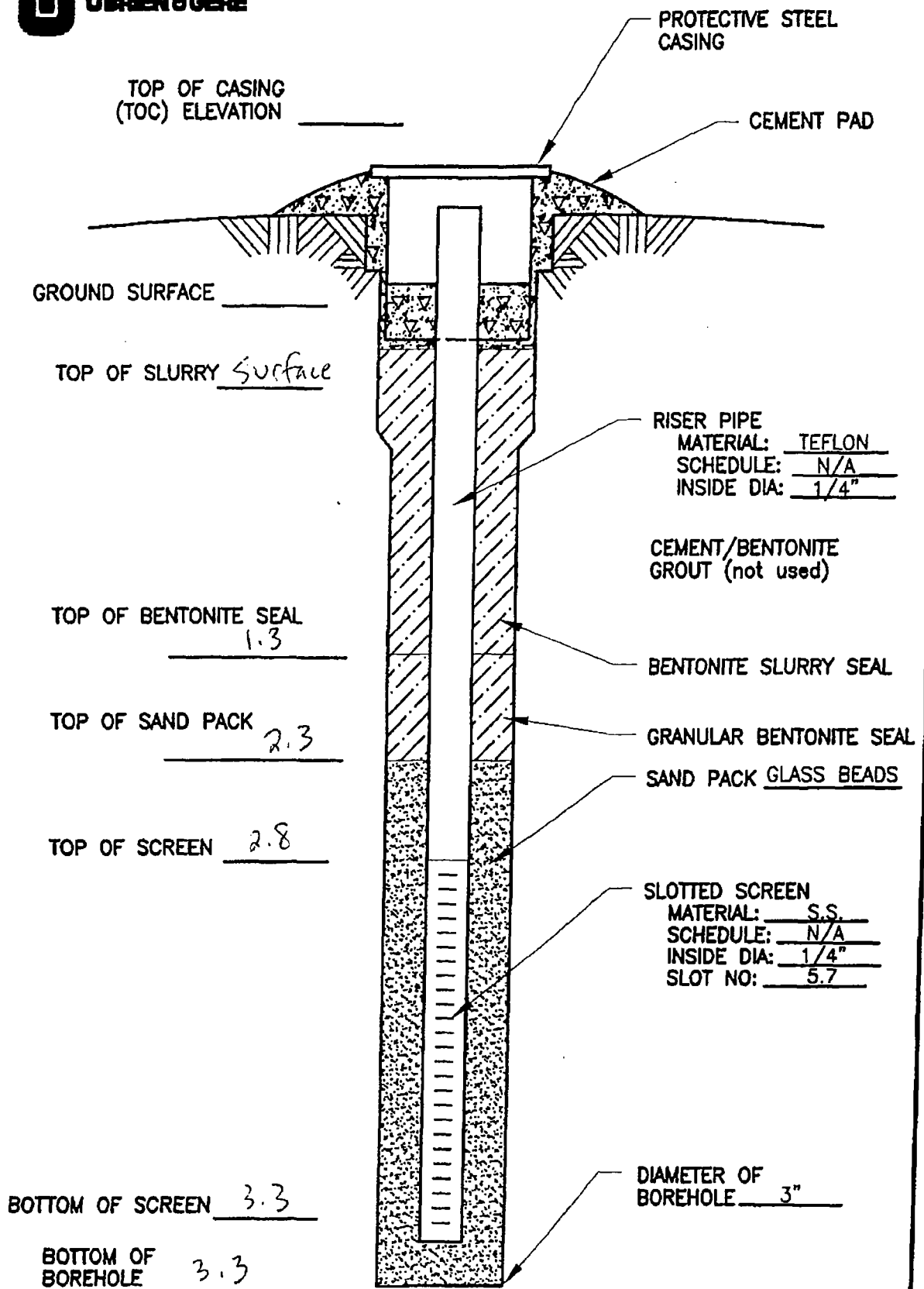
 <b>O'BRIEN &amp; GERE</b> ENGINEERS, INC.				<b>SOIL BORING LOG</b>		BORING I.D.: SG-12													
				Boring Location: Northwest side of WLA		PAGE 1 OF 1													
CLIENT: NBIA OU1 PRP Group PROJECT NAME: VI Study PROJECT LOCATION: Bronson, Michigan FILE NO.: 12716/41686#4				Drilling equipment: Geoprobe 6600 ATV Sampling equipment: Stainless steel macro-core sampler, 5 ft by 2" d.a. Borehole Diameter: 2.5 inches Total Depth: 5 feet below grade		Surface Elevation (ft MSL): Top of Casing Elevation (ft MSL): Northing: Easting: Depth to ground water: 4'													
BORING COMPANY: Stearns Drilling Co. FOREMAN: Mike Hefferan OBG GEOLOGIST: Kevin Schneider				Start date: 4/23/2008 Completion date: 4/23/2008		LEGEND: <table border="1" style="display: inline-table; vertical-align: top;"> <tr> <td></td> <td>Bentonite Slurry</td> <td></td> <td>Screen</td> </tr> <tr> <td></td> <td>Granular Bentonite</td> <td></td> <td>Riser</td> </tr> <tr> <td></td> <td>Sand Pack (Glass Beads)</td> <td></td> <td></td> </tr> </table>			Bentonite Slurry		Screen		Granular Bentonite		Riser		Sand Pack (Glass Beads)		
	Bentonite Slurry		Screen																
	Granular Bentonite		Riser																
	Sand Pack (Glass Beads)																		
DEPTH BELOW GRADE	CORE INTERVAL (ft bg)	PENETR/ RECOVERY (ft bg)	Analytical Sample Interval (ft bg)	SAMPLE DESCRIPTION		STRATUM CHANGE GENERAL DESCRPT	Equipment Installed	Field Testing											
								FID											
0	0 - 5	3.5'	5'	Vegetation at surface, dark yellowish brown 10YR 4/2, damp, silty SAND		(SM)													
1				Moderate yellowish brown 10YR 5/4, damp, sandy CLAY		1' (CL)			0.0										
2				Moderate yellowish brown 10YR 5/4, damp silty SAND		2' (SM)			0.0										
3				Same as above, little gravel		2.5'			0.0										
3				Dark yellowish orange 10YR 6/6, moist, well graded SAND, little silt, trace gravel		3' (SP-SM)			0.0										
4				Same as above, except wet		4 0'			0.0										
5				Dark yellowish orange 10YR 6/6, wet, fine SAND		4.5' (SP)			0.0										
5				End of Boring at 5 fbg		5'													
6																			
7																			
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Notes:  
 1. Subsequent to soil sampling activities the initial borehole was backfilled with bentonite.  
 2. 5 ft hydraulic probe macro core sampler used, therefore no blow counts.  
 3. The depth to water in the initial borehole was at 4.0 fbg.  
 4. A soil vapor point was subsequently installed adjacent to the initial borehole location. The probe point was set at 2.5-3 fbg and completed as a flush mount.



## ***APPENDIX B***

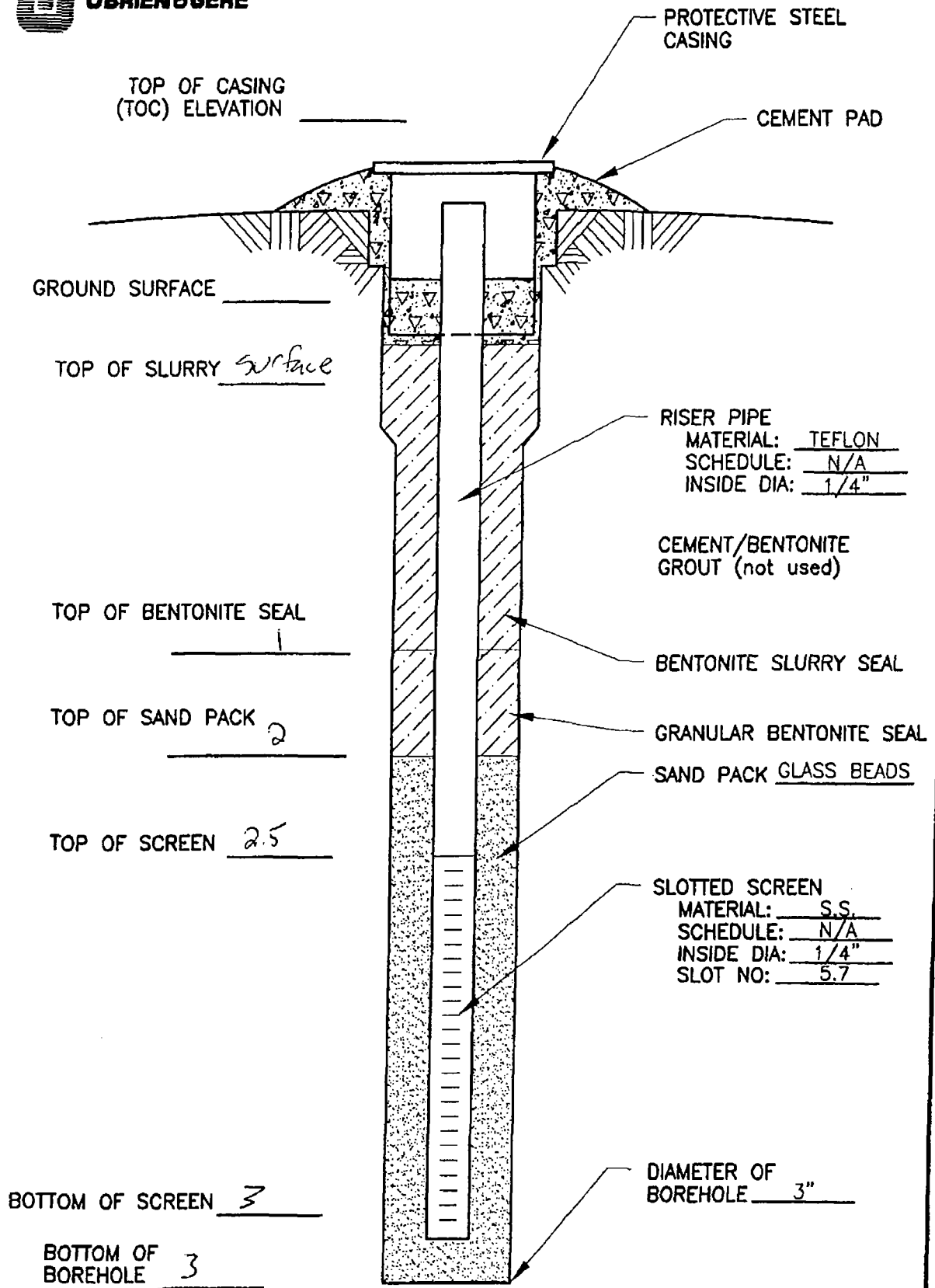
### ***Vapor Probe Construction Details***



NORTH BRONSON INDUSTRIAL AREA SITE  
BRONSON, MICHIGAN  
SG-8



O'BRIEN GERE

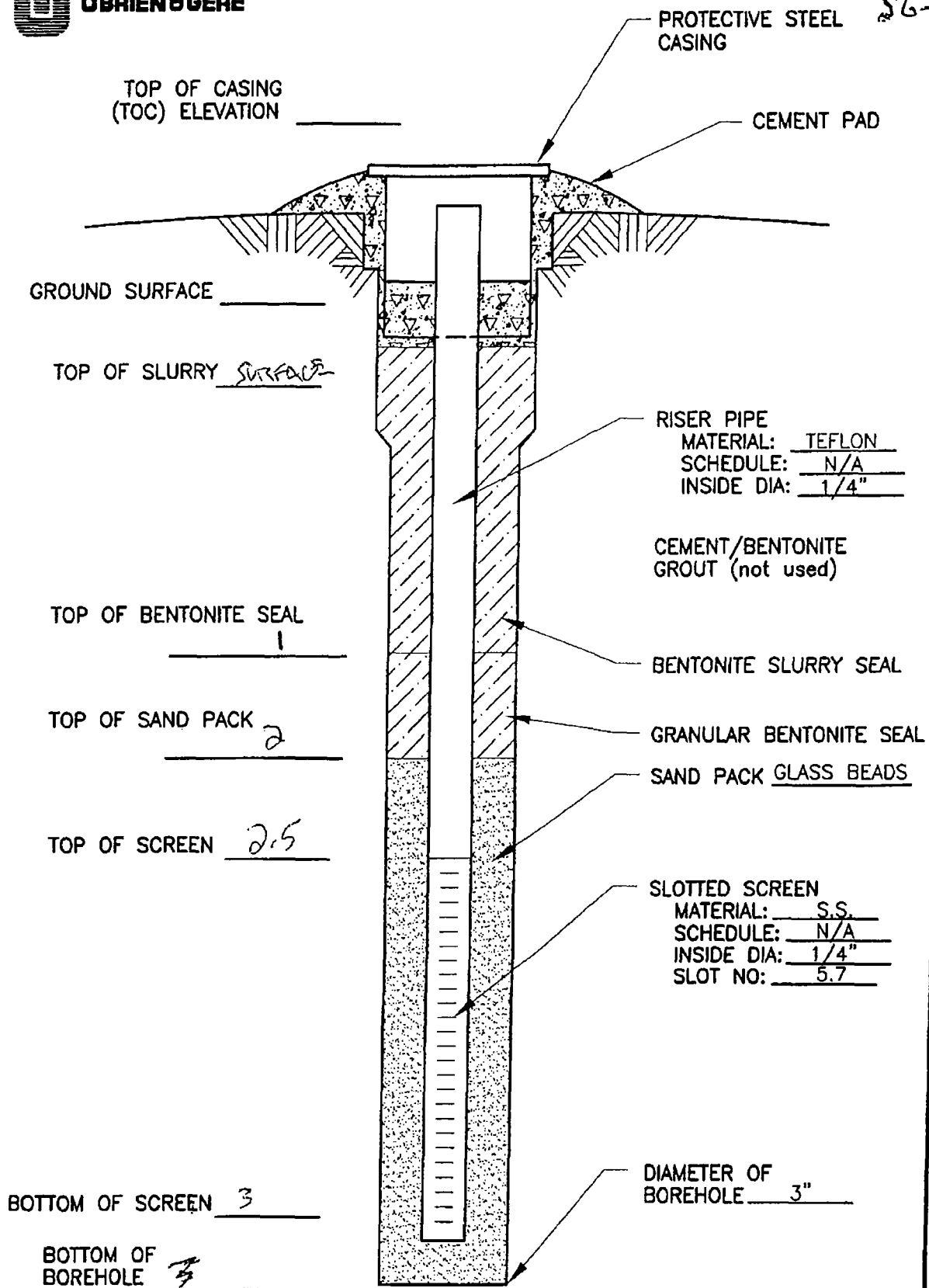


NORTH BRONSON INDUSTRIAL AREA SITE  
BRONSON, MICHIGAN  
SG-9

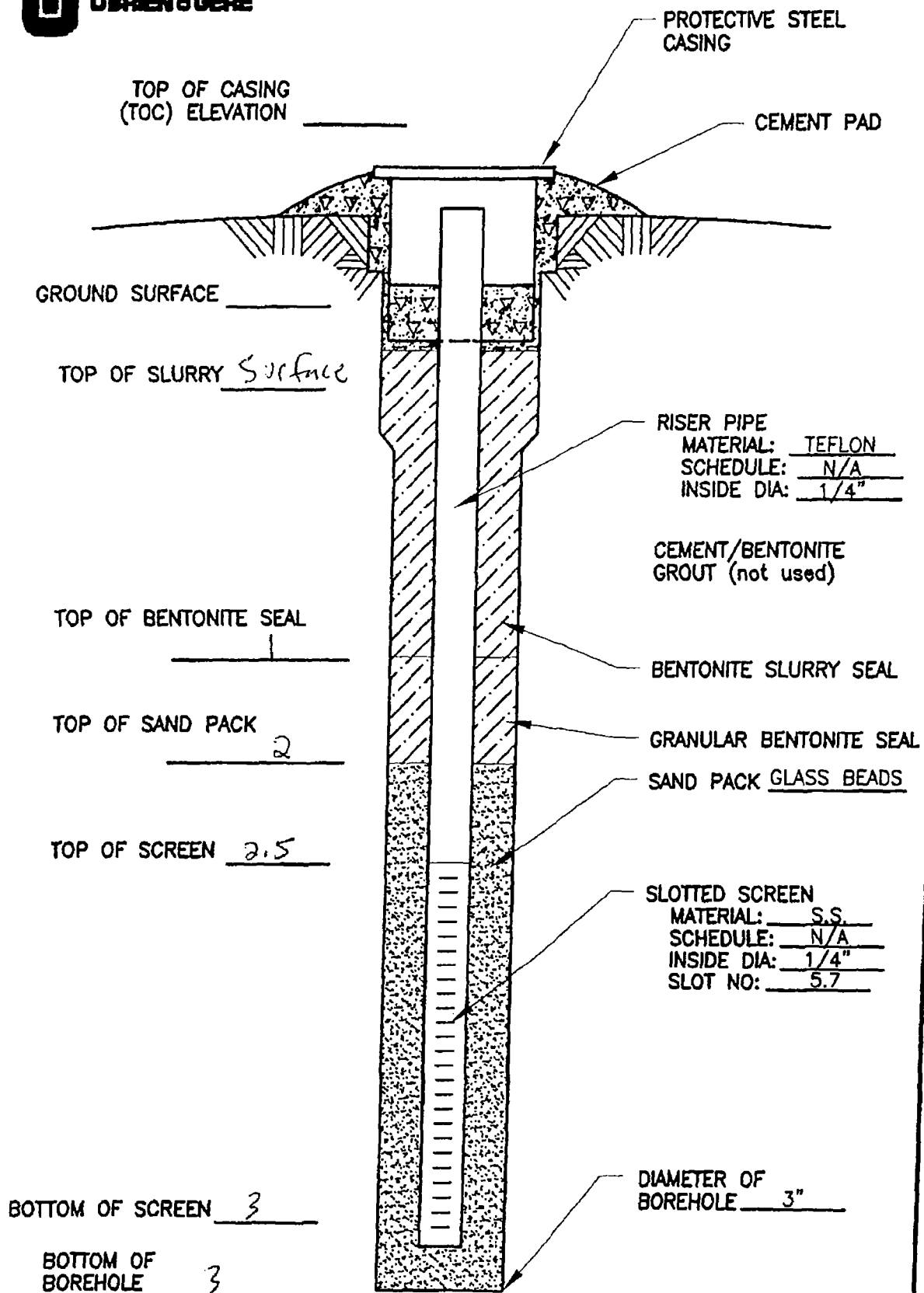


O'BRIEN & GERE

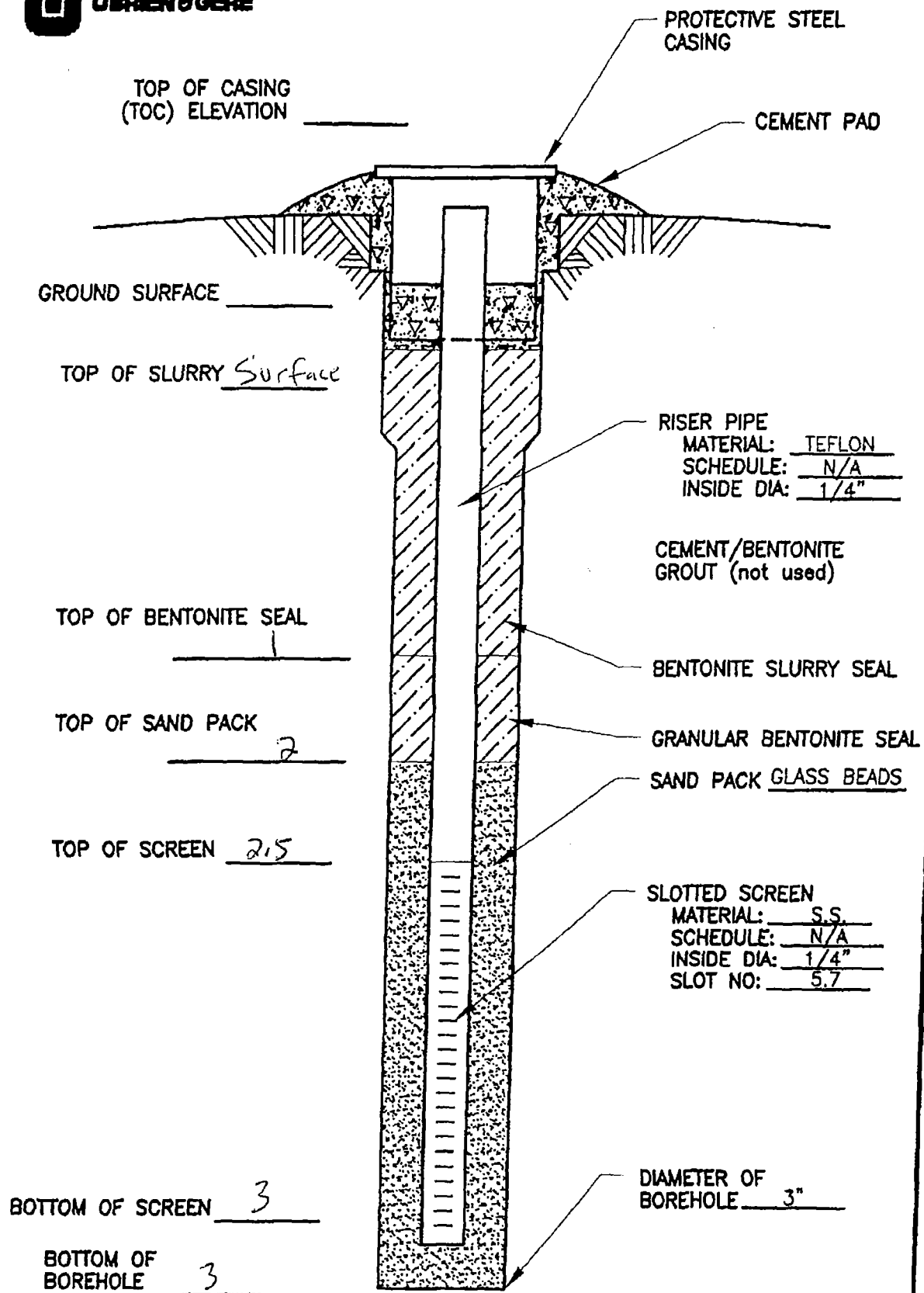
SG-10



NORTH BRONSON INDUSTRIAL AREA SITE  
BRONSON, MICHIGAN  
SG-10



NORTH BRONSON INDUSTRIAL AREA SITE  
BRONSON, MICHIGAN  
SG-11



NORTH BRONSON INDUSTRIAL AREA SITE  
BRONSON, MICHIGAN  
SG-12

## ***APPENDIX C***

### ***Soil Vapor Sample Collection Field Forms***

**O'BRIEN & GERE**Soil Vapor (Canister) Sample Collection Field Form

Project #	41686.001.002	Date	4/24/08
Project Name	NBIA VI Study	Collector	M. ROBISON / K. SCHNEIDER
Sample ID	SG- 8	Vacuum gauge "zero" ("Hg)	0
Start Date/Time	4/24/08 12:20	Start Pressure ("Hg)	-29.5
End Date/Time	4/24/08 16:20	End Pressure ("Hg)	-6.1
Canister ID	2975	End pressure > "zero"?	yes
Flow controller ID	3981	Sampling duration (intended)	4 hours
Associated ambient air sample ID	N/A	Depth of sample point below grade	2.8 - 3.3
Analytical method required	TO-15	Laboratory used	TestAmerica Burlington

Tubing type used	Teflon	Length of tubing	7 ft	Tubing volume	cc
Volume purged	cc @ 0.1 l/min (100cc/min)	1 to 3 volumes purged @ < 200cc/min?	Yes		
Chamber tracer gas conc.	98% / 98%	Tracer gas conc. during purging	0% / 0% POST		
Gas Analyzer Readings	%O <sub>2</sub> N/A %CO <sub>2</sub> N/A %CH <sub>4</sub> N/A	PID/FID reading	0 / 0	(ppmv)	
Noticeable odor	NO	Soil type			

## Weather Conditions during Probe Installation:

Air temperature (°F)	71°	Rainfall	NONE	Wind direction	NNE
Barometric pressure	30.21			Wind speed (mph)	10

Substantial changes in weather conditions during sampling or over the past 24 to 48 hrs:

NO

## Weather Conditions at Start of Sampling:

Air temperature (°F)	68°	Rainfall	NONE	Wind direction	ESE
Barometric pressure	30.22			Wind speed (mph)	10

Substantial changes in weather conditions during sampling or over the past 24 to 48 hrs:

NO

**Site Plan** showing sample location, buildings, landmarks, potential soil vapor and outdoor air sources, preferential pathways

Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



**O'BRIEN & GERE****Soil Vapor (Canister) Sample Collection Field Form**

Project #	41686.001.002	Date	4/24/08
Project Name	NBIA VI Study	Collector	M. ROBISON / K. CROWNEIDER
Sample ID	SG-9	Vacuum gauge "zero" ("Hg)	0
Start Date/Time	4/24/08 13:05	Start Pressure ("Hg)	-29
End Date/Time	4/24/08 17:05	End Pressure ("Hg)	-11
Canister ID	3242	End pressure > "zero"?	yes
Flow controller ID	3979	Sampling duration (intended)	4 hours
Associated ambient air sample ID	N/A	Depth of sample point below grade	2.5 - 3.0
Analytical method required	TO-15	Laboratory used	TestAmerica Burlington

Tubing type used	Teflon	Length of tubing	7 ft	Tubing volume	cc
Volume purged	cc @ 0.1 l/min (100cc/min)	1 to 3 volumes purged @ < 200cc/min?	Yes		
Chamber tracer gas conc.	99% / 99%	Tracer gas conc. during purging	0% / 0%		
Gas Analyzer Readings	%O <sub>2</sub> N/A %CO <sub>2</sub> N/A %CH <sub>4</sub> N/A	PID/FID reading	0/0	(ppmv)	
Noticeable odor	NO	Soil type			

## Weather Conditions during Probe Installation:

Air temperature (°F)	73	Rainfall	NO	Wind direction	NNE
Barometric pressure	30.21			Wind speed (mph)	11

Substantial changes in weather conditions during sampling or over the past 24 to 48 hrs:

NO

## Weather Conditions at Start of Sampling:

Air temperature (°F)	69	Rainfall	NO	Wind direction	ESE
Barometric pressure	30.21			Wind speed (mph)	20

Substantial changes in weather conditions during sampling or over the past 24 to 48 hrs:

NO

Site Plan showing sample location, buildings, landmarks, potential soil vapor and outdoor air sources, preferential pathways

(3%)

Comments:

**OBRIEN & GERE****Soil Vapor (Canister) Sample Collection Field Form**

Project #	41686.001.002	Date	4/24/08
Project Name	NBIA VI Study	Collector	M. ROBINOW / K. SCHWABER
Sample ID	SG-10	Vacuum gauge "zero" ("Hg)	0
Start Date/Time	4/24/08 1340	Start Pressure ("Hg)	-29
End Date/Time	4/24/08 17:40	End Pressure ("Hg)	-5
Canister ID	2892	End pressure > "zero"?	YES
Flow controller ID	2913	Sampling duration (intended)	4 hours
Associated ambient air sample ID	N/A	Depth of sample point below grade	2.5-3.0
Analytical method required	TO-15	Laboratory used	TestAmerica Burlington

Tubing type used	Teflon	Length of tubing	7 ft	cm	Tubing volume		cc
Volume purged		cc @ 0.1 l/min (100cc/min)	1 to 3 volumes purged @ < 200cc/min?	Yes			
Chamber tracer gas conc.	97.6/97%	Tracer gas conc. during purging	0% / 0% END				
Gas Analyzer Readings	%O <sub>2</sub> N/A	%CO <sub>2</sub> N/A	%CH <sub>4</sub> N/A	PID/FID reading	0.6 / 0	(ppmv)	
Noticeable odor	NO	Soil type					

## Weather Conditions during Probe Installation:

Air temperature (°F)	72	Rainfall	NONE	Wind direction	NNE
Barometric pressure	30.21			Wind speed (mph)	10

Substantial changes in weather conditions during sampling or over the past 24 to 48 hrs:

NO

## Weather Conditions at Start of Sampling:

Air temperature (°F)	72	Rainfall	NONE	Wind direction	SE
Barometric pressure	30.19			Wind speed (mph)	10

Substantial changes in weather conditions during sampling or over the past 24 to 48 hrs:

NO

Site Plan showing sample location, buildings, landmarks, potential soil vapor and outdoor air sources, preferential pathways

(54%)

Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**O'BRIEN & GERE****Soil Vapor (Canister) Sample Collection Field Form**

Project #	41686.001.002	Date	4/24/08
Project Name	NBIA VI Study	Collector	M. ROSSIGNOL / K. SCHNEIDER
Sample ID	SG- 11	Vacuum gauge "zero" ("Hg)	0
Start Date/Time	4/24/08 1420	Start Pressure ("Hg)	-29
End Date/Time	1820	End Pressure ("Hg)	-4
Canister ID	2584	End pressure > "zero"?	YES
Flow controller ID	2806	Sampling duration (intended)	4 hours
Associated ambient air sample ID	N/A	Depth of sample point below grade	2.5 - 3.0
Analytical method required	TO-15	Laboratory used	TestAmerica Burlington

Tubing type used	Teflon	Length of tubing	7 ft	Tubing volume	cc
Volume purged	cc @ 0.1 l/min (100cc/min)	1 to 3 volumes purged @ < 200cc/min?	Yes		
Chamber tracer gas conc.	98.5% / 98%	Tracer gas conc. during purging	0% / 0% POST		
Gas Analyzer Readings	%O <sub>2</sub> N/A %CO <sub>2</sub> N/A %CH <sub>4</sub> N/A	PID/FID reading	0 / 0	(ppmv)	
Noticeable odor	NO	Soil type			

**Weather Conditions during Probe Installation:**

Air temperature (°F)	73	Rainfall	NONE	Wind direction	NNE
Barometric pressure	30.21			Wind speed (mph)	11

Substantial changes in weather conditions during sampling or over the past 24 to 48 hrs:

NO

**Weather Conditions at Start of Sampling:**

Air temperature (°F)	78°	Rainfall	NONE	Wind direction	SW ESE
Barometric pressure	30.19			Wind speed (mph)	15

Substantial changes in weather conditions during sampling or over the past 24 to 48 hrs:

NO

**Site Plan** showing sample location, buildings, landmarks, potential soil vapor and outdoor air sources, preferential pathways

Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**O'BRIEN & GERE****Soil Vapor (Canister) Sample Collection Field Form**

Project # 41686.001.002 Date 4/25/08  
Project Name NBIA VI Study Collector M ROBINSON / K SCHNEIDER  
Sample ID SG-12 / DUP-1 Vacuum gauge "zero" ("Hg) 0 DUP-1  
Start Date/Time 4/25/08 10:45 Start Pressure ("Hg) -29.7 / -29.7  
End Date/Time 4/25/08 14:45 End Pressure ("Hg) -31 / -3  
Canister ID 4118 / 4323 End pressure > "zero"? yes  
Flow controller ID 3301 / 3106 Sampling duration (intended) 4 hours  
Associated ambient air sample ID N/A Depth of sample point below grade 2.5 - 3.0  
Analytical method required TO-15 Laboratory used TestAmerica Burlington

Tubing type used Teflon Length of tubing 7 ft. am Tubing volume \_\_\_\_\_ cc  
Volume purged \_\_\_\_\_ cc @ 0.1 l/min (100cc/min) 1 to 3 volumes purged @ < 200cc/min? Yes  
Chamber tracer gas conc. 100% / 99% Tracer gas conc. during purging 0% / 0%  
Gas Analyzer Readings %O<sub>2</sub> N/A %CO<sub>2</sub> N/A %CH<sub>4</sub> N/A PID/FID reading 0 / 0 (ppmv)  
Noticeable odor \_\_\_\_\_ Soil type \_\_\_\_\_

## Weather Conditions during Probe Installation:

Air temperature (°F) 73 Rainfall NONE Wind direction N  
Barometric pressure 30.21 Wind speed (mph) 8

Substantial changes in weather conditions during sampling or over the past 24 to 48 hrs:

NO

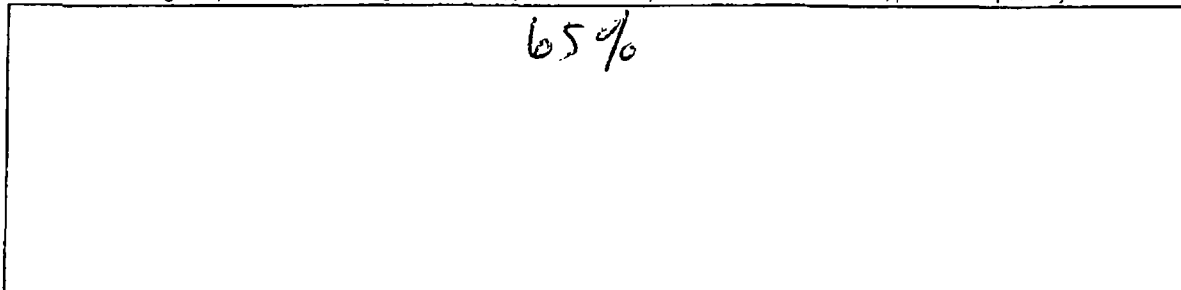
## Weather Conditions at Start of Sampling:

Air temperature (°F) 71 Rainfall NONE Wind direction S  
Barometric pressure 29.87 Wind speed (mph) 8

Substantial changes in weather conditions during sampling or over the past 24 to 48 hrs:

NO

Site Plan showing sample location, buildings, landmarks, potential soil vapor and outdoor air sources, preferential pathways



Comments: \_\_\_\_\_

## ***APPENDIX D***

### ***Analytical Laboratory Report***

TestAmerica  
South Burlington, VT

Sample Data Summary  
Package

SDG: 125196

# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

May 9, 2008

TestAmerica Laboratories, Inc.

Mr. Leo Brausch  
The North Bronson PRP Group  
131 Wedgewood Drive  
Gibsonia, PA 15044

Re: Laboratory Project No. 28000  
Case: 28000; SDG: 125196

Dear Mr. Brausch:

Enclosed are the analytical results for the samples that were received by TestAmerica Burlington on April 26<sup>th</sup>, 2008. Laboratory identification numbers were assigned, and designated as follows:

<u>Lab ID</u>	<u>Client Sample ID</u>	<u>Sample Date</u>	<u>Sample Matrix</u>
Received: 04/26/08 ETR No: 125196			
750199	SG-8/2.8-3.3	04/24/08	AIR
750200	SG-9/2.5-3.0	04/24/08	AIR
750201	SG-10/2.5-3.0	04/24/08	AIR
750202	SG-11/2.5-3.0	04/24/08	AIR
750203	SG-12/2.5-3.0	04/25/08	AIR
750204	DUP-1		AIR
750205	FB-1	04/25/08	AIR

Documentation of the condition of the samples at the time of their receipt and any exception to the laboratory's Sample Acceptance Policy is documented in the Sample Handling section of this submittal.

The volatile organics analyses for the majority of the samples referenced above were accomplished at dilution based on screen analyses to ensure quantitation of all target constituents within the range of calibrated instrument response.

Any reference within this report to Severn Trent Laboratories, Inc. or STL, should be understood to refer to TestAmerica Laboratories, Inc. (formerly known as Severn Trent Laboratories, Inc.) The analytical results associated with the samples presented in this test report were generated under a quality system that adheres to requirements specified in the NELAC standard. Release of the data in this test report and any associated electronic deliverables is authorized by the Laboratory Director's designee as verified by the following signature.

May 9, 2008  
Mr. Leo Brausch  
Page 2 of 2



If there are any questions regarding this submittal, please contact me at 802 660-1990.

Sincerely,

A handwritten signature in black ink, appearing to read "Don Dawicki". The signature is stylized with a large, sweeping "D" and "A".

Don Dawicki  
Project Manager

Enclosure



TO-14/15  
Result Summary

CLIENT SAMPLE NO.

SG-8/2.8-3.3

Lab Name: TAL Burlington

SDG Number: 125196

Dilution Factor: 2.50

Sample Matrix: AIR

Lab Sample No.: 750199

Date Analyzed: 04/30/08

Date Received: 04/26/08

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Vinyl Chloride	75-01-4	0.50	U	0.50	1.3	U	1.3
trans-1,2-Dichloroethene	156-60-5	0.50	U	0.50	2.0	U	2.0
cis-1,2-Dichloroethene	156-59-2	0.50	U	0.50	2.0	U	2.0
Trichloroethene	79-01-6	75		0.50	400		2.7

TO-14/15  
Result Summary

CLIENT SAMPLE NO.

SG-10/2.5-3.0

Lab Name: TAL Burlington

SDG Number: 125196

Dilution Factor: 5.60

Sample Matrix: AIR

Lab Sample No.: 750201

Date Analyzed: 05/01/08

Date Received: 04/26/08

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Vinyl Chloride	75-01-4	1.1	U	1.1	2.8	U	2.8
trans-1,2-Dichloroethene	156-60-5	1.1	U	1.1	4.4	U	4.4
cis-1,2-Dichloroethene	156-59-2	1.1	U	1.1	4.4	U	4.4
Trichloroethene	79-01-6	210		1.1	1100		5.9

**TO-14/15**  
**Result Summary**

CLIENT SAMPLE NO.

SG-11/2.5-3.0

Lab Name: TAL Burlington

SDG Number: 125196

Dilution Factor: 1.00

Sample Matrix: AIR

Lab Sample No.: 750202

Date Analyzed: 05/01/08

Date Received: 04/26/08

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Vinyl Chloride	75-01-4	0.20	U	0.20	0.51	U	0.51
trans-1,2-Dichloroethene	156-60-5	0.20	U	0.20	0.79	U	0.79
cis-1,2-Dichloroethene	156-59-2	0.20	U	0.20	0.79	U	0.79
Trichloroethene	79-01-6	8.5		0.20	46		1.1

**TO-14/15  
Result Summary**

CLIENT SAMPLE NO.

SG-12/2.5-3.0

Lab Name: TAL Burlington

SDG Number: 125196

Dilution Factor: 6.25

Sample Matrix: AIR

Lab Sample No.: 750203

Date Analyzed: 05/01/08

Date Received: 04/26/08

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Vinyl Chloride	75-01-4	1.3	U	1.3	3.3	U	3.3
trans-1,2-Dichloroethene	156-60-5	1.3	U	1.3	5.2	U	5.2
cis-1,2-Dichloroethene	156-59-2	1.3	U	1.3	5.2	U	5.2
Trichloroethene	79-01-6	210		1.3	1100		7.0

**TO-14/15  
Result Summary**

CLIENT SAMPLE NO.

DUP-1

Lab Name: TAL Burlington

SDG Number: 125196

Dilution Factor: 6.06

Sample Matrix: AIR

Lab Sample No.: 750204

Date Analyzed: 05/01/08

Date Received: 04/26/08

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Vinyl Chloride	75-01-4	1.2	U	1.2	3.1	U	3.1
trans-1,2-Dichloroethene	156-60-5	1.2	U	1.2	4.8	U	4.8
cis-1,2-Dichloroethene	156-59-2	1.2	U	1.2	4.8	U	4.8
Trichloroethene	79-01-6	230		1.2	1200		6.4

TO-14/15  
Result Summary

CLIENT SAMPLE NO.

FB-1

Lab Name: TAL Burlington

SDG Number: 125196

Dilution Factor: 1.00

Sample Matrix: AIR

Lab Sample No.: 750205

Date Analyzed: 05/01/08

Date Received: 04/26/08

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Vinyl Chloride	75-01-4	0.20	U	0.20	0.51	U	0.51
trans-1,2-Dichloroethene	156-60-5	0.20	U	0.20	0.79	U	0.79
cis-1,2-Dichloroethene	156-59-2	0.20	U	0.20	0.79	U	0.79
Trichloroethene	79-01-6	0.20	U	0.20	1.1	U	1.1

**TO-14/15  
Result Summary**

CLIENT SAMPLE NO.

CA043008LCS

Lab Name: TAL Burlington

SDG Number: 125196

Dilution Factor: 1.00

Sample Matrix: AIR

Lab Sample No.: CA043008

Date Analyzed: 04/30/08

Date Received: / /

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Vinyl Chloride	75-01-4	10		0.20	26		0.51
trans-1,2-Dichloroethene	156-60-5	9.6		0.20	38		0.79
cis-1,2-Dichloroethene	156-59-2	10		0.20	40		0.79
Trichloroethene	79-01-6	9.8		0.20	53		1.1

**TO-14/15  
Result Summary**

CLIENT SAMPLE NO.

CA043008LCSD

Lab Name: TAL Burlington

SDG Number: 125196

Dilution Factor: 1.00

Sample Matrix: AIR

Lab Sample No.: CA043008

Date Analyzed: 04/30/08

Date Received: / /

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Vinyl Chloride	75-01-4	11		0.20	28		0.51
trans-1,2-Dichloroethene	156-60-5	9.9		0.20	39		0.79
cis-1,2-Dichloroethene	156-59-2	11		0.20	44		0.79
Trichloroethene	79-01-6	10		0.20	54		1.1



**TO-14/15  
Result Summary**

CLIENT SAMPLE NO.

CA050108LCS

Lab Name: TAL Burlington

SDG Number: 125196

Dilution Factor: 1.00

Sample Matrix: AIR

Lab Sample No.: CA050108

Date Analyzed: 05/01/08

Date Received: / /

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Vinyl Chloride	75-01-4	10		0.20	26		0.51
trans-1,2-Dichloroethene	156-60-5	9.6		0.20	38		0.79
cis-1,2-Dichloroethene	156-59-2	10		0.20	40		0.79
Trichloroethene	79-01-6	9.2		0.20	49		1.1

TO-14/15  
Result Summary

CLIENT SAMPLE NO.

CA050108LCSD

Lab Name: TAL Burlington

SDG Number: 125196

Dilution Factor: 1.00

Sample Matrix: AIR

Lab Sample No.: CA050108

Date Analyzed: 05/01/08

Date Received: / /

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Vinyl Chloride	75-01-4	11		0.20	28		0.51
trans-1,2-Dichloroethene	156-60-5	10		0.20	40		0.79
cis-1,2-Dichloroethene	156-59-2	11		0.20	44		0.79
Trichloroethene	79-01-6	9.9		0.20	53		1.1

TO-14/15  
Result Summary

CLIENT SAMPLE NO.

MBLK043008CA

Lab Name: TAL Burlington

SDG Number: 125196

Dilution Factor: 1.00

Sample Matrix: AIR

Lab Sample No.: MBLK0430

Date Analyzed: 04/30/08

Date Received: / /

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Vinyl Chloride	75-01-4	0.20	U	0.20	0.51	U	0.51
trans-1,2-Dichloroethene	156-60-5	0.20	U	0.20	0.79	U	0.79
cis-1,2-Dichloroethene	156-59-2	0.20	U	0.20	0.79	U	0.79
Trichloroethene	79-01-6	0.20	U	0.20	1.1	U	1.1

TO-14/15  
Result Summary

CLIENT SAMPLE NO.

MBLK050108CA

Lab Name: TAL Burlington

SDG Number: 125196

Dilution Factor: 1.00

Sample Matrix: AIR

Lab Sample No.: MBLK0501

Date Analyzed: 05/01/08

Date Received: / /

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Vinyl Chloride	75-01-4	0.20	U	0.20	0.51	U	0.51
trans-1,2-Dichloroethene	156-60-5	0.20	U	0.20	0.79	U	0.79
cis-1,2-Dichloroethene	156-59-2	0.20	U	0.20	0.79	U	0.79
Trichloroethene	79-01-6	0.20	U	0.20	1.1	U	1.1

## **TestAmerica Burlington Data Qualifier Definitions**

---

### **Organic**

- U: Compound analyzed but not detected at a concentration above the reporting limit.
- J: Estimated value.
- N: Indicates presumptive evidence of a compound. This flag is used only for tentatively identified compounds (TICs) where the identification of a compound is based on a mass spectral library search.
- P: SW-846: The relative percent difference for detected concentrations between two GC columns is greater than 40%. Unless otherwise specified the higher of the two values is reported on the Form I.
- CLP SOW: Greater than 25% difference for detected concentrations between two GC columns. Unless otherwise specified the lower of the two values is reported on the Form I.
- C: Pesticide result whose identification has been confirmed by GC/MS.
- B: Analyte is found in the sample and the associated method blank. The flag is used for tentatively identified compounds as well as positively identified compounds.
- E: Compounds whose concentrations exceed the upper limit of the calibration range of the instrument for that specific analysis.
- D: Concentrations identified from analysis of the sample at a secondary dilution.
- A: Tentatively identified compound is a suspected aldol condensation product.
- X,Y,Z: Laboratory defined flags that may be used alone or combined, as needed. If used, the description of the flag is defined in the project narrative.

### **Inorganic/Metals**

- E: Reported value is estimated due to the presence of interference.
- N: Matrix spike sample recovery is not within control limits.
- \* Duplicate sample analysis is not within control limits.
- B: The result reported is less than the reporting limit but greater than the instrument detection limit.
- U: Analyte was analyzed for but not detected above the reporting limit.

#### **Method Codes:**

- P ICP-AES  
MS ICP-MS  
CV Cold Vapor AA  
AS Semi-Automated Spectrophotometric

# TestAmerica Burlington

30 Community Drive  
Suite 11

South Burlington, VT 05403

phone 802-660-1990 fax 802-660-1919

## Canister Samples Chain of Custody Record

TestAmerica Analytical Testing Corp. assumes no liability with respect to the collection and shipment of these samples.

Client Contact Information		Project Manager: <u>CLIFF YANTZ</u>		Samples Collected By: <u>M. ROBISON / K. SCHWABER</u>		1 of 2 COCs									
Company:	<u>ORRIEN + LEROE</u>	Phone:	<u>248 477 5701</u>	EPA 3C	EPA 25C	ASTM D-1946	Other (Please specify in notes section)								
Address:	<u>37000 GRAND RIVER</u>	Email:	<u>YANTZCS@ORL.COM</u>	TO-14A	TO-15	Canister ID	Flow Controller ID								
City/State/Zip:	<u>FRAMINGTON NH 03043</u>	Site Contact:	<u>CLIFF YANTZ</u>	Canister Vacuum In Field, "Hg (Start)	Canister Vacuum In Field, "Hg (Stop)	Time Start	Time Stop								
Phone:	<u>248 477 5701</u>	STL Contact:	<u>DON DAWICKI</u>	Analysis Turnaround Time	Standard (Specify)	Rush (Specify)									
FAX:	<u>248 477 5702</u>	Project Name:	<u>VAPOR INTRUSION INVESTIGATION</u>												
Site:	<u>NBIA DUA BRONSON, MA</u>	PO #	<u>41686</u>												
<b>(PLEASE PRINT FRG)</b>															
Sample Identification	Sample Date(s)	Time Start	Time Stop	Canister Vacuum In Field, "Hg (Start)	Canister Vacuum In Field, "Hg (Stop)	Flow Controller ID	Canister ID								
S6-8 / 2.8-3.3	4/24/08	12:20	16:20	-29.5	-6	3981	2975								
S6-9 / 2.5-3.0	4/24/08	13:05	17:05	-29	-11	3479	3242								
S6-10 / 2.5-3.0	4/24/08	13:40	17:40	-29	-5	2913	2892								
S6-11 / 2.5-3.0	4/24/08	14:20	18:20	-29	-4	2806	2584								
S6-12 / 2.5-3.0	4/25/08	10:45	14:45	-29.7	-11	3301	4118								
DUP-1	4/25/08	10:45	14:45	-29.7	-3	3106	4323								
<table border="1"> <thead> <tr> <th colspan="2">Temperature (Fahrenheit)</th> </tr> <tr> <th>Interior</th> <th>Ambient</th> </tr> </thead> <tbody> <tr> <td>Start</td> <td></td> </tr> <tr> <td>Stop</td> <td></td> </tr> </tbody> </table>								Temperature (Fahrenheit)		Interior	Ambient	Start		Stop	
Temperature (Fahrenheit)															
Interior	Ambient														
Start															
Stop															
<table border="1"> <thead> <tr> <th colspan="2">Pressure (inches of Hg)</th> </tr> <tr> <th>Interior</th> <th>Ambient</th> </tr> </thead> <tbody> <tr> <td>Start</td> <td></td> </tr> <tr> <td>Stop</td> <td></td> </tr> </tbody> </table>								Pressure (inches of Hg)		Interior	Ambient	Start		Stop	
Pressure (inches of Hg)															
Interior	Ambient														
Start															
Stop															
Special Instructions/QC Requirements & Comments:															

Samples Shipped by: 7 (M. ROBISON) Date/Time: 4/23/08 16:00  
 Samples Relinquished by: 7 (M. ROBISON) Date/Time: 4/23/08 16:00  
 Relinquished by: 7 (M. ROBISON) Date/Time: 4/23/08 16:00

Samples Received by: 4/26/08 10:15  
 Received by: 4/26/08 10:15  
 Received by: 4/26/08 10:15

Lab Use Only: Shipper Name: FEDEX AIRBILL # 851749766083  
 Condition: 851749766083





THE LEADER IN ENVIRONMENTAL TESTING

## Sample Data Summary – TO-15 Volatile



FORM 1  
VOLATILE ORGANICS ANALYSIS DATA SHEET

NBPRP SAMPLE NO.

DUP-1

Lab Name: TESTAMERICA BURLINGTON

Contract: 28000

Lab Code: STLV

Case No.: 28000

SAS No.:

SDG No.: 125196

Matrix: (soil/water) AIR

Lab Sample ID: 750204

Sample wt/vol: 33.00 (g/mL) ML

Lab File ID: 750204D

Level: (low/med) LOW

Date Received: 04/26/08

% Moisture: not dec. \_\_\_\_\_

Date Analyzed: 05/01/08

GC Column: RTX-624 ID: 0.32 (mm)

Dilution Factor: 6.1

Soil Extract Volume: \_\_\_\_\_ (uL)

Soil Aliquot Volume: \_\_\_\_\_ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
---------	----------	--	---

75-01-4-----	Vinyl Chloride	1.2	U
156-60-5-----	trans-1,2-Dichloroethene	1.2	U
156-59-2-----	cis-1,2-Dichloroethene	1.2	U
79-01-6-----	Trichloroethene	230	

FORM 1  
VOLATILE ORGANICS ANALYSIS DATA SHEET

NBPRP SAMPLE NO.

FB-1

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: 125196

Matrix: (soil/water) AIR Lab Sample ID: 750205

Sample wt/vol: 200.0 (g/mL) ML Lab File ID: 750205

Level: (low/med) LOW Date Received: 04/26/08

% Moisture: not dec. \_\_\_\_\_ Date Analyzed: 05/01/08

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: \_\_\_\_\_ (uL) Soil Aliquot Volume: \_\_\_\_\_ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
---------	----------	--	---

75-01-4-----	Vinyl Chloride	0.20	U
156-60-5-----	trans-1,2-Dichloroethene	0.20	U
156-59-2-----	cis-1,2-Dichloroethene	0.20	U
79-01-6-----	Trichloroethene	0.20	U

FORM 1  
VOLATILE ORGANICS ANALYSIS DATA SHEET

NBPRP SAMPLE NO.

SG-10 2.5-3.0

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: 125196

Matrix: (soil/water) AIR Lab Sample ID: 750201

Sample wt/vol: 36.00 (g/mL) ML Lab File ID: 750201D

Level: (low/med) LOW Date Received: 04/26/08

% Moisture: not dec. \_\_\_\_\_ Date Analyzed: 05/01/08

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 5.6

Soil Extract Volume: \_\_\_\_\_ (uL) Soil Aliquot Volume: \_\_\_\_\_ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
---------	----------	--	---

75-01-4-----	Vinyl Chloride	1.1	U
156-60-5-----	trans-1,2-Dichloroethene	1.1	U
156-59-2-----	cis-1,2-Dichloroethene	1.1	U
79-01-6-----	Trichloroethene	210	

FORM 1  
VOLATILE ORGANICS ANALYSIS DATA SHEET

NBPRP SAMPLE NO.

SG-11 2.5-3.0

Lab Name: TESTAMERICA BURLINGTON      Contract: 28000

Lab Code: STLV      Case No.: 28000      SAS No.:      SDG No.: 125196

Matrix: (soil/water) AIR      Lab Sample ID: 750202

Sample wt/vol:      200.0 (g/mL) ML      Lab File ID:      750202

Level: (low/med) LOW      Date Received: 04/26/08

% Moisture: not dec.      Date Analyzed: 05/01/08

GC Column: RTX-624      ID: 0.32 (mm)      Dilution Factor: 1.0

Soil Extract Volume:      (uL)      Soil Aliquot Volume:      (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
---------	----------	--	---

75-01-4-----Vinyl Chloride	0.20	U
156-60-5-----trans-1,2-Dichloroethene	0.20	U
156-59-2-----cis-1,2-Dichloroethene	0.20	U
79-01-6-----Trichloroethene	8.5	

FORM 1  
VOLATILE ORGANICS ANALYSIS DATA SHEET

NBPRP SAMPLE NO.

SG-12 2.5-3.0

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: 125196

Matrix: (soil/water) AIR Lab Sample ID: 750203

Sample wt/vol: 32.00 (g/mL) ML Lab File ID: 750203D2

Level: (low/med) LOW Date Received: 04/26/08

% Moisture: not dec. Date Analyzed: 05/01/08

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 6.2

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
---------	----------	--	---

75-01-4-----	Vinyl Chloride	1.3	U
156-60-5-----	trans-1,2-Dichloroethene	1.3	U
156-59-2-----	cis-1,2-Dichloroethene	1.3	U
79-01-6-----	Trichloroethene	210	

FORM 1  
VOLATILE ORGANICS ANALYSIS DATA SHEET

NBPRP SAMPLE NO.

SG-8 2.8-3.3

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: 125196

Matrix: (soil/water) AIR Lab Sample ID: 750199

Sample wt/vol: 80.00 (g/mL) ML Lab File ID: 750199D

Level: (low/med) LOW Date Received: 04/26/08

% Moisture: not dec. \_\_\_\_\_ Date Analyzed: 04/30/08

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 2.5

Soil Extract Volume: \_\_\_\_\_ (uL) Soil Aliquot Volume: \_\_\_\_\_ (uL)

CAS NO. COMPOUND CONCENTRATION UNITS:  
(ug/L or ug/Kg) PPBV Q

75-01-4-----	Vinyl Chloride	0.50	U
156-60-5-----	trans-1,2-Dichloroethene	0.50	U
156-59-2-----	cis-1,2-Dichloroethene	0.50	U
79-01-6-----	Trichloroethene	75	

FORM 1  
VOLATILE ORGANICS ANALYSIS DATA SHEET

NBPRP SAMPLE NO.

SG-9 2.5-3.0

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: 125196

Matrix: (soil/water) AIR Lab Sample ID: 750200

Sample wt/vol: 200.0 (g/mL) ML Lab File ID: 750200

Level: (low/med) LOW Date Received: 04/26/08

% Moisture: not dec. \_\_\_\_\_ Date Analyzed: 05/01/08

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: \_\_\_\_\_ (uL) Soil Aliquot Volume: \_\_\_\_\_ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
---------	----------	--	---

75-01-4-----	Vinyl Chloride	0.20	U
156-60-5-----	trans-1,2-Dichloroethene	0.20	U
156-59-2-----	cis-1,2-Dichloroethene	0.20	U
79-01-6-----	Trichloroethene	0.31	

FORM 1  
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MBLK043008CA

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: 125196

Matrix: (soil/water) AIR Lab Sample ID: MBLK043008CA

Sample wt/vol: 200.0 (g/mL) ML Lab File ID: CGKB01Q

Level: (low/med) LOW Date Received: \_\_\_\_\_

% Moisture: not dec. \_\_\_\_\_ Date Analyzed: 04/30/08

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: \_\_\_\_\_ (uL) Soil Aliquot Volume: \_\_\_\_\_ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
---------	----------	--	---

75-01-4-----	Vinyl Chloride	0.20	U
156-60-5-----	trans-1,2-Dichloroethene	0.20	U
156-59-2-----	cis-1,2-Dichloroethene	0.20	U
79-01-6-----	Trichloroethene	0.20	U



FORM 1  
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MBLK050108CA

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: 125196

Matrix: (soil/water) AIR Lab Sample ID: MBLK050108CA

Sample wt/vol: 200.0 (g/mL) ML Lab File ID: CGKB01R

Level: (low/med) LOW Date Received: \_\_\_\_\_

% Moisture: not dec. \_\_\_\_\_ Date Analyzed: 05/01/08

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: \_\_\_\_\_ (uL) Soil Aliquot Volume: \_\_\_\_\_ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
---------	----------	--	---

75-01-4-----	Vinyl Chloride	0.20	U
156-60-5-----	trans-1,2-Dichloroethene	0.20	U
156-59-2-----	cis-1,2-Dichloroethene	0.20	U
79-01-6-----	Trichloroethene	0.20	U

FORM 1  
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

CA043008LCS

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STL Case No.: 28000 SAS No.: SDG No.: 125196

Matrix: (soil/water) AIR Lab Sample ID: CA043008LCS

Sample wt/vol: 200.0 (g/mL) ML Lab File ID: CGK10QOD

Level: (low/med) LOW Date Received: \_\_\_\_\_

% Moisture: not dec. \_\_\_\_\_ Date Analyzed: 04/30/08

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: \_\_\_\_\_ (uL) Soil Aliquot Volume: \_\_\_\_\_ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
---------	----------	--	---

75-01-4-----	Vinyl Chloride	10	
156-60-5-----	trans-1,2-Dichloroethene	9.6	
156-59-2-----	cis-1,2-Dichloroethene	10	
79-01-6-----	Trichloroethene	9.8	

FORM 1  
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

CA043008LCSD

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: 125196

Matrix: (soil/water) AIR Lab Sample ID: CA043008LCSD

Sample wt/vol: 200.0 (g/mL) ML Lab File ID: CGK10QQ2

Level: (low/med) LOW Date Received: \_\_\_\_\_

% Moisture: not dec. \_\_\_\_\_ Date Analyzed: 04/30/08

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: \_\_\_\_\_ (uL) Soil Aliquot Volume: \_\_\_\_\_ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
---------	----------	--	---

75-01-4-----	Vinyl Chloride	11	
156-60-5-----	trans-1,2-Dichloroethene	9.9	
156-59-2-----	cis-1,2-Dichloroethene	11	
79-01-6-----	Trichloroethene	10	

FORM 1  
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

CA050108LCS

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLX Case No.: 28000 SAS No.: SDG No.: 125196

Matrix: (soil/water) AIR Lab Sample ID: CA050108LCS

Sample wt/vol: 200.0 (g/mL) ML Lab File ID: CGK10RQD

Level: (low/med) LOW Date Received: \_\_\_\_\_

% Moisture: not dec. \_\_\_\_\_ Date Analyzed: 05/01/08

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: \_\_\_\_\_ (uL) Soil Aliquot Volume: \_\_\_\_\_ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
---------	----------	--	---

75-01-4-----	Vinyl Chloride	10	
156-60-5-----	trans-1,2-Dichloroethene	9.6	
156-59-2-----	cis-1,2-Dichloroethene	10	
79-01-6-----	Trichloroethene	9.2	

FORM 1  
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

CA050108LCSD

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: 125196

Matrix: (soil/water) AIR Lab Sample ID: CA050108LCSD

Sample wt/vol: 200.0 (g/mL) ML Lab File ID: CGK10RQ2

Level: (low/med) LOW Date Received: \_\_\_\_\_

% Moisture: not dec. \_\_\_\_\_ Date Analyzed: 05/01/08

GC Column: RTX-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: \_\_\_\_\_ (uL) Soil Aliquot Volume: \_\_\_\_\_ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
---------	----------	--	---

75-01-4-----	Vinyl Chloride	11	
156-60-5-----	trans-1,2-Dichloroethene	10	
156-59-2-----	cis-1,2-Dichloroethene	11	
79-01-6-----	Trichloroethene	9.9	

FORM 3  
AIR VOLATILE LAB CONTROL SAMPLE

Lab Name: TESTAMERICA BURLINGTON      Contract: 28000

Lab Code: STLV      Case No.: 28000      SAS No.:      SDG No.: 125196

Matrix Spike - Sample No.: CA043008LCS

COMPOUND	SPIKE ADDED (ppbv)	SAMPLE CONCENTRATION (ug/L)	LCS CONCENTRATION (ppbv)	LCS % REC #	QC. LIMITS REC.
Vinyl Chloride	10		10	100	70-130
trans-1,2-Dichloroethen	10		9.6	96	70-130
cis-1,2-Dichloroethene	10		10	100	70-130
Trichloroethene	10		9.8	98	70-130

COMPOUND	SPIKE ADDED (ppbv)	LCSD CONCENTRATION (ppbv)	LCSD % REC #	% RPD #	QC LIMITS	
					RPD	REC.
Vinyl Chloride	10	11	110	10	25	70-130
trans-1,2-Dichloroethen	10	9.9	99	3	25	70-130
cis-1,2-Dichloroethene	10	11	110	10	25	70-130
Trichloroethene	10	10	100	2	25	70-130

# Column to be used to flag recovery and RPD values with an asterisk

\* Values outside of QC limits

RPD: 0 out of 4 outside limits

Spike Recovery: 0 out of 8 outside limits

COMMENTS:

FORM 3  
AIR VOLATILE LAB CONTROL SAMPLE

Lab Name: TESTAMERICA BURLINGTON      Contract: 28000

Lab Code: STLV      Case No.: 28000      SAS No.:      SDG No.: 125196

Matrix Spike - Sample No.: CA050108LCS

COMPOUND	SPIKE ADDED (ppbv)	SAMPLE CONCENTRATION (ug/L)	LCS CONCENTRATION (ppbv)	LCS % REC #	QC. LIMITS REC.
Vinyl Chloride	10		10	100	70-130
trans-1,2-Dichloroethen	10		9.6	96	70-130
cis-1,2-Dichloroethene	10		10	100	70-130
Trichloroethene	10		9.2	92	70-130

COMPOUND	SPIKE ADDED (ppbv)	LCSD CONCENTRATION (ppbv)	LCSD % REC #	% RPD #	QC LIMITS	
					RPD	REC.
Vinyl Chloride	10	11	110	10	25	70-130
trans-1,2-Dichloroethen	10	10	100	4	25	70-130
cis-1,2-Dichloroethene	10	11	110	10	25	70-130
Trichloroethene	10	9.9	99	7	25	70-130

# Column to be used to flag recovery and RPD values with an asterisk

\* Values outside of QC limits

RPD: 0 out of 4 outside limits

Spike Recovery: 0 out of 8 outside limits

COMMENTS:

FORM 4  
VOLATILE METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

MBLK043008CA

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: 125196

Lab File ID: CGKB01Q Lab Sample ID: MBLK043008CA

Date Analyzed: 04/30/08 Time Analyzed: 1536

GC Column: RTX-624 ID: 0.32 (mm) Heated Purge: (Y/N) N

Instrument ID: C

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
	=====	=====	=====	=====
01	CA043008LCS	CA043008LCS	CGK10QQD	1349
02	CA043008LCSD	CA043008LCSD	CGK10QQ2	1442
03	SG-8 2.8-3.3	750199	750199D	2013
04	SG-9 2.5-3.0	750200	750200	0039
05	SG-10 2.5-3.	750201	750201D	0412
06	DUP-1	750204	750204D	0558
07	SG-11 2.5-3.	750202	750202	0841
08	FB-1	750205	750205	0933
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COMMENTS:



FORM 4  
VOLATILE METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

MBLK050108CA

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: 125196

Lab File ID: CGKB01R Lab Sample ID: MBLK050108CA

Date Analyzed: 05/01/08 Time Analyzed: 1657

GC Column: RTX-624 ID: 0.32 (mm) Heated Purge: (Y/N) N

Instrument ID: C

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
	=====	=====	=====	=====
01	CA050108LCS	CA050108LCS	CGK10RQD	1513
02	CA050108LCSD	CA050108LCSD	CGK10RQ2	1604
03	SG-12 2.5-3.	750203	750203D2	2141
04				
05				
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COMMENTS:

FORM 5  
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK  
BROMOFLUOROBENZENE (BFB)

Lab Name: TESTAMERICA BURLINGTON      Contract: 28000  
Lab Code: STLV      Case No.: 28000      SAS No.:      SDG No.: 125196  
Lab File ID: CGK01PV      BFB Injection Date: 04/14/08  
Instrument ID: C      BFB Injection Time: 0843  
GC Column: RTX-624      ID: 0.32 (mm)      Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	8.0 - 40.0% of mass 95	16.2
75	30.0 - 66.0% of mass 95	47.7
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.7
173	Less than 2.0% of mass 174	0.0 ( 0.0)1
174	50.0 - 120.0% of mass 95	92.0
175	4.0 - 9.0% of mass 174	6.8 ( 7.4)1
176	93.0 - 101.0% of mass 174	89.4 ( 97.2)1
177	5.0 - 9.0% of mass 176	5.9 ( 6.6)2

1-Value is % mass 174      2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	ASTD0002	ASTD0002	CGK002V	04/14/08	0932
02	ASTD0005	ASTD0005	CGK005V	04/14/08	1024
03	ASTD005	ASTD005	CGK05V	04/14/08	1114
04	ASTD010	ASTD010	CGK10V	04/14/08	1205
05	ASTD015	ASTD015	CGK15V	04/14/08	1256
06	ASTD020	ASTD020	CGK20V	04/14/08	1347
07	ASTD040	ASTD040	CGK40V	04/14/08	1437
08					
09					
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22					

FORM 5  
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK  
BROMOFLUOROBENZENE (BFB)

Lab Name: TESTAMERICA BURLINGTON      Contract: 28000  
Lab Code: STLV      Case No.: 28000      SAS No.:      SDG No.: 125196  
Lab File ID: CGK19PV      BFB Injection Date: 04/30/08  
Instrument ID: C      BFB Injection Time: 1017  
GC Column: RTX-624      ID: 0.32 (mm)      Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	8.0 - 40.0% of mass 95	17.8
75	30.0 - 66.0% of mass 95	51.4
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	7.3
173	Less than 2.0% of mass 174	0.0 ( 0.0)1
174	50.0 - 120.0% of mass 95	83.5
175	4.0 - 9.0% of mass 174	6.0 ( 7.1)1
176	93.0 - 101.0% of mass 174	80.6 ( 96.5)1
177	5.0 - 9.0% of mass 176	5.2 ( 6.4)2

1-Value is % mass 174      2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	ASTD010	ASTD010	CGK10QV2	04/30/08	1203
02	CA043008LCS	CA043008LCS	CGK10QQD	04/30/08	1349
03	CA043008LCSD	CA043008LCSD	CGK10QQ2	04/30/08	1442
04	MBLK043008CA	MBLK043008CA	CGKB01Q	04/30/08	1536
05	SG-8 2.8-3.3	750199	750199D	04/30/08	2013
06	SG-9 2.5-3.0	750200	750200	05/01/08	0039
07	SG-10 2.5-3.	750201	750201D	05/01/08	0412
08	DUP-1	750204	750204D	05/01/08	0558
09	SG-11 2.5-3.	750202	750202	05/01/08	0841
10	FB-1	750205	750205	05/01/08	0933
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					

FORM 5  
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK  
BROMOFLUOROBENZENE (BFB)

Lab Name: TESTAMERICA BURLINGTON      Contract: 28000  
Lab Code: STLV      Case No.: 28000      SAS No.:      SDG No.: 125196  
Lab File ID: CGK20PV      BFB Injection Date: 05/01/08  
Instrument ID: C      BFB Injection Time: 1119  
GC Column: RTX-624      ID: 0.32 (mm)      Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	8.0 - 40.0% of mass 95	18.5
75	30.0 - 66.0% of mass 95	54.7
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	7.1
173	Less than 2.0% of mass 174	0.0 ( 0.0)1
174	50.0 - 120.0% of mass 95	86.9
175	4.0 - 9.0% of mass 174	6.1 ( 7.0)1
176	93.0 - 101.0% of mass 174	84.4 ( 97.1)1
177	5.0 - 9.0% of mass 176	5.7 ( 6.7)2

1-Value is % mass 174      2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	ASTD010	ASTD010	CGK10RV2	05/01/08	1328
02	CA050108LCS	CA050108LCS	CGK10RQD	05/01/08	1513
03	CA050108LCSD	CA050108LCSD	CGK10RQ2	05/01/08	1604
04	MBLK050108CA	MBLK050108CA	CGKB01R	05/01/08	1657
05	SG-12 2.5-3.	750203	750203D2	05/01/08	2141
06					
07					
08					
09					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					

Lab Name: TESTAMERICA BURLINGTON Contract: 28000

Lab Code: STLV Case No.: 28000 SAS No.: SDG No.: 125196

Instrument ID: C Calibration Date(s): 04/14/08 04/14/08

Heated Purge: (Y/N) N Calibration Time(s): 0932 1437

GC Column: RTX-624 ID: 0.32 (mm)

[illegible]

3/90

Lab Name: TESTAMERICA BURLINGTON		Contract: 28000	
Lab Code: STLV	Case No.: 28000	SAS No.:	SDG No.: 125196
Instrument ID: C	Calibration Date(s): 04/14/08	04/14/08	
Heated Purge: (Y/N) N	Calibration Time(s): 0932	1437	
GC Column: RTX-624	ID: 0.32	(mm)	

\* Compounds with required minimum RRF and maximum %RSD values.  
All other compounds must meet a minimum RRF of 0.010.

FORM 7  
VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: TESTAMERICA BURLINGTON      Contract: 28000  
 Lab Code: STLV      Case No.: 28000      SAS No.:      SDG No.: 125196  
 Instrument ID: C      Calibration Date: 04/30/08      Time: 1203  
 Lab File ID: CGK10QV2      Init. Calib. Date(s): 04/14/08      04/14/08  
 Heated Purge: (Y/N) N      Init. Calib. Times:      0932      1437  
 GC Column: RTX-624      ID: 0.32      (mm)

COMPOUND	$\overline{RRF}$	RRF10	MIN RRF	%D	MAX %D
Vinyl Chloride	0.815	0.816	0.01	0.1	30.0
trans-1,2-Dichloroethene	1.381	1.320	0.01	4.4	30.0
cis-1,2-Dichloroethene	1.207	1.212	0.01	0.4	30.0
Trichloroethene	0.380	0.354	0.01	6.8	30.0

FORM 7  
VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: TESTAMERICA BURLINGTON      Contract: 28000  
 Lab Code: STLV      Case No.: 28000      SAS No.:      SDG No.: 125196  
 Instrument ID: C      Calibration Date: 05/01/08      Time: 1328  
 Lab File ID: CGK10RV2      Init. Calib. Date(s): 04/14/08      04/14/08  
 Heated Purge: (Y/N) N      Init. Calib. Times:      0932      1437  
 GC Column: RTX-624      ID: 0.32 (mm)

COMPOUND	RRF	RRF10	MIN RRF	%D	MAX %D
Vinyl Chloride	0.815	0.753	0.01	7.6	30.0
trans-1,2-Dichloroethene	1.381	1.221	0.01	11.6	30.0
cis-1,2-Dichloroethene	1.207	1.131	0.01	6.3	30.0
Trichloroethene	0.380	0.331	0.01	12.9	30.0



FORM 8  
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: TESTAMERICA BURLINGTON      Contract: 28000  
Lab Code: STLV      Case No.: 28000      SAS No.:      SDG No.: 125196  
Lab File ID (Standard): CGK10QV2      Date Analyzed: 04/30/08  
Instrument ID: C      Time Analyzed: 1203  
GC Column: RTX-624      ID: 0.32 (mm)      Heated Purge: (Y/N) N

	IS1 (BCM)	RT #	IS2 (DFB)	RT #	IS3 (CBZ)	RT #
	AREA #		AREA #		AREA #	
=====	=====	=====	=====	=====	=====	=====
12 HOUR STD	461582	8.94	2217132	9.79	2057653	12.21
UPPER LIMIT	646215	9.27	3103985	10.12	2880714	12.54
LOWER LIMIT	276949	8.61	1330279	9.46	1234592	11.88
=====	=====	=====	=====	=====	=====	=====
CLIENT						
SAMPLE NO.						
=====	=====	=====	=====	=====	=====	=====
01 CA043008LCS	478286	8.94	2166058	9.79	1913968	12.21
02 CA043008LCSD	478519	8.94	2137378	9.79	1875794	12.21
03 MBLK043008CA	445884	8.94	2256099	9.79	1932788	12.21
04 SG-8 2.8-3.3	323308	8.94	1489722	9.79	1355814	12.21
05 SG-9 2.5-3.0	341007	8.94	1648445	9.79	1506630	12.21
06 SG-10 2.5-3.	324011	8.94	1622281	9.79	1572617	12.21
07 DUP-1	324971	8.94	1553296	9.79	1423295	12.21
08 SG-11 2.5-3.	365231	8.94	1537136	9.79	1502305	12.21
09 FB-1	369558	8.94	1855316	9.79	1672484	12.21
10						
11						
12						
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21						
22						

IS1 (BCM) = Bromochloromethane  
IS2 (DFB) = 1,4-Difluorobenzene  
IS3 (CBZ) = Chlorobenzene-d5

AREA UPPER LIMIT = + 40% of internal standard area  
AREA LOWER LIMIT = - 40% of internal standard area  
RT UPPER LIMIT = + 0.33 minutes of internal standard RT  
RT LOWER LIMIT = - 0.33 minutes of internal standard RT

# Column used to flag values outside QC limits with an asterisk.  
\* Values outside of QC limits.

FORM 8  
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: TESTAMERICA BURLINGTON      Contract: 28000  
Lab Code: STLV      Case No.: 28000      SAS No.:      SDG No.: 125196  
Lab File ID (Standard): CGK10RV2      Date Analyzed: 05/01/08  
Instrument ID: C      Time Analyzed: 1328  
GC Column: RTX-624      ID: 0.32 (mm)      Heated Purge: (Y/N) N

		IS1 (BCM) AREA #	RT #	IS2 (DFB) AREA #	RT #	IS3 (CBZ) AREA #	RT #
=====		=====	=====	=====	=====	=====	=====
12 HOUR STD		484251	8.94	2307602	9.79	2247807	12.21
UPPER LIMIT		677951	9.27	3230643	10.12	3146930	12.54
LOWER LIMIT		290551	8.61	1384561	9.46	1348684	11.88
=====		=====	=====	=====	=====	=====	=====
CLIENT							
SAMPLE NO.							
=====		=====	=====	=====	=====	=====	=====
01 CA050108LCS		470330	8.94	2268625	9.79	1902449	12.21
02 CA050108LCS		478593	8.94	2165231	9.79	2057013	12.21
03 MBLK050108CA		441714	8.94	2266411	9.79	1979312	12.21
04 SG-12 2.5-3.		313568	8.94	1535429	9.79	1535193	12.21
05							
06							
07							
08							
09							
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21							
22							

IS1 (BCM) = Bromochloromethane  
IS2 (DFB) = 1,4-Difluorobenzene  
IS3 (CBZ) = Chlorobenzene-d5

AREA UPPER LIMIT = + 40% of internal standard area  
AREA LOWER LIMIT = - 40% of internal standard area  
RT UPPER LIMIT = + 0.33 minutes of internal standard RT  
RT LOWER LIMIT = - 0.33 minutes of internal standard RT

# Column used to flag values outside QC limits with an asterisk.  
\* Values outside of QC limits.

# TestAmerica Burlington

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## Canister Samples Chain of Custody Record

TestAmerica Analytical Testing Corp. assumes no liability with respect to the collection and shipment of these samples.

<b>Client Contact Information</b> Company: OBRIEN + LEROE Address: 37000 GRAND RIVER City/State/Zip: BURLINGTON VT 05403 Phone: 802-477-5301 FAX: 802-477-5301 Project Name: VAPOR INTRUSION INVESTIGATION Site: NRIA OUT BRANSON, MI PO #: 416266				<b>Project Manager:</b> CLIFF YANTZ <b>Phone:</b> 248 477 5301 <b>Email:</b> YANTZCS@ORL.COM <b>Site Contact:</b> CLIFF YANTZ <b>STL Contact:</b> DON BAWICKI <b>Analysis Turnaround Time:</b> Standard (Specify) <input checked="" type="checkbox"/> Rush (Specify)				<b>Samples Collected By:</b> M ROBINSON / K SCANSIDER 1 of 2 COCS							
<b>Sample Identification</b> (PROBE DEPTH FBG) S6-8 / 2.8-3.3 S6-9 / 2.5-3.0 S6-10 / 2.5-3.0 S6-11 / 2.5-3.0 S6-12 / 2.5-3.0 DUP-1				Sample Date(s) 4/24/08 4/25/08 4/25/08	Time Start 12:20 13:05 13:40 14:20 10:45 ---	Time Stop 16:20 17:05 17:40 18:20 14:45 ---	Canister Vacuum In Field, "Hg (Start) -29.5 -29 -29 -29 -29.7 -29.7	Canister Vacuum In Field, "Hg (Stop) -10 -11 -5 -4 -11 -3	Flow Controller ID 3981 3979 2913 2806 3301 3106	Canister ID 2975 3242 2892 2584 4118 4323	TO-15 X X X X X	EPA 3C EPA 25C ASTM D-1946 Other (Please specify in notes section)	Sample Type Other (Please specify in notes section)	Indoor Air Ambient Air Soil Gas Landfill Gas Other (Please specify in notes section)	
<b>Special Instructions/QC Requirements &amp; Comments:</b>															
Samples Shipped by: 7 (M. ROBINSON) 4/25/08 16:00 Date/Time:				Samples Received by: 4/26/08 10:15 Date/Time:				Samples Relinquished by:				Relinquished by:			
Date/Time:				Date/Time:				Date/Time:				Date/Time:			
Shipper Name:				Condition:				Condition:				Condition:			

FEDEX AIRBILL #  
851749766083

## Canister Samples Chain of Custody Record

phone 802-660-1990 fax 802-660-1919

## ***APPENDIX E***

### ***Data Validation Report***

To: Cliff Yantz cc:  
From: KA Storne  
Re: Review of Data for the NBIA Site Lagoon Sludge  
Treatability Study, Sampling Performed April 2008  
File: 12716/41686.002.001  
Date: June 5, 2008

This memorandum provides the data validation results for the soil vapor samples collected for the NBIA Site Lagoon Sludge Treatability Study in Michigan. O'Brien & Gere conducted sample collection activities in April 2008.

The following table summarizes the analysis performed for this sampling event.

**Table 1-1. Analytical methods and references**

Parameter	Method	Reference
VOCs	USEPA Method TO-15	1
Note: 1. United States Environmental Protection Agency. 1999. <i>Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air</i> . Cincinnati, Ohio.  VOCs indicates volatile organic compounds.		

TestAmerica Laboratories, Inc. Burlington (TAL-Burlington) of South Burlington, Vermont performed the analyses for this sampling event.

The laboratory packages generated by TAL-Burlington contained quality control analysis and supportive raw data.

Full validation was performed on the samples collected for this sampling event.

The analytical data generated for this investigation were evaluated by O'Brien & Gere using the quality assurance/quality control (QA/QC) information presented in the following documents:

- O'Brien & Gere. 2007. *Vapor Intrusion Work Plan, North Bronson Industrial Area, Operable Unit 1, Bronson, Michigan*. Farmington Hills, Michigan.
- United States Environmental Protection Agency. 1999. *Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air*. Cincinnati, Ohio.

Data affected by excursions from the previously mentioned QA/QC criteria were qualified using the following USEPA data validation guidance and professional judgment:

- United States Environmental Protection Agency (USEPA). 2006. *Validating Volatile Organic Analysis of Ambient Air in canister by Method TO-15. SOP HW-31, Revision 4*. Albany, New York

USEPA data validation guidelines have been modified to reflect the requirements of the method used in the analysis of samples collected for this sampling event. Qualifiers were applied to data that failed to meet the quality control criteria presented in the USEPA method.

The validation included checking the following parameters:

- Work plan compliance
- Chain-of-custody records
- Sample collection
- Holding times
- Calibrations
- Blank analysis
- Laboratory control sample (LCS) analysis
- Laboratory duplicate analysis
- Internal standards performance
- Gas chromatography/mass spectrometry (GC/MS) instrument performance check
- Target analyte quantitation, identification, and QLs
- Documentation completeness.

The samples that were submitted for data validation are listed in Table 1-2 presented in Attachment A.

The following sections of this memorandum present the results of the comparison of the analytical data to the QA/QC criteria specified above. Based on the QA/QC information review, an overall evaluation of data usability is also presented in the final section.

#### **VALIDATION APPROACH**

The following approach is used to evaluate calibration data for USEPA Method TO-15:

- VOC target analytes are evaluated using the criteria of 30 percent relative standard deviation (%RSD) or correlation coefficient criteria of 0.990 for initial calibration curves.
- Calibration verifications were evaluated using a criterion of 30 percent difference (%D) for target analytes.

Data are qualified using the following approach for evaluation of quality control data in this type of validation:

- Laboratory established control limits are used to assess LCS and laboratory duplicate data.
- If percent recoveries are less than laboratory control limits but greater than ten percent, non-detected and detected results are qualified as approximate (UJ, J) to indicate minor excursions.
- If percent recoveries are greater than laboratory control limits, detected results are qualified as approximate (J) to indicate minor excursions. Non-detected results are not qualified.
- If percent recoveries are less than ten percent, detected results are qualified as approximate (J) and non-detected results are qualified as rejected (R) to indicate major excursions.
- If RPDs for laboratory duplicates are outside of laboratory control limits, detected results are qualified as approximate (J) to indicate minor excursions.
- Qualification of data associated with laboratory duplicate excursions was limited to the laboratory duplicate pair.

- For blank evaluation, if target analytes are detected in the sample at a concentration that is less than five times the concentration detected in the associated blank, the sample result is qualified as "U".
- Internal standard recoveries are evaluated using control limits of within 40% of the associated calibration verification standard. The results for target analytes associated with internal standard area recoveries 25% or greater but less than the lower standard area are qualified as approximate (J, UJ) to indicate minor internal standard recovery excursions. The non-detected results for target analytes associated with internal standard area recoveries less than 25% are rejected (R) to indicate major recovery excursions.

The cumulative effect of the various QA/QC excursions is employed in assigning the final data qualifiers. For example, if a sample result is affected by low LCS recovery for which the "J" qualifier is applied, but severely low internal standard recoveries result in the rejection of the sample result (R), the final qualifier is "R".

### **VOLATILE ORGANIC COMPOUND IN AIR DATA EVALUATION SUMMARY**

The following QA/QC parameters were found to meet method and validation criteria or did not result in additional qualification of sample results:

- Work plan compliance
- Chain-of-custody records
- Sample collection
- Holding times
- Calibrations
- Blank analysis
- LCS analysis
- Laboratory duplicate analysis
- Internal standards performance
- GC/MS instrument performance check
- Target analyte identification
- Documentation completeness.

No method or validation criteria excursions were identified for the data generated from this sampling event and the data were not qualified.

Additional observations are described below.

#### **I. Target analyte quantitation and QLs.**

Due to elevated target analyte concentrations, dilutions were performed for the following samples: SG-8/2.8-3.3, SG-10/2.5-3.0, SG-12/2.5-3.0, and DUP-1[SG-12/2.5-3.0]. Only the diluted results were reported for these samples.

Sample results were reported to the QL.

### **DATA USABILITY**

Overall data usability with respect to completeness for the final sample results reported is 100 percent for the VOC air data. Based on the validation performed, the Work Plan completeness goal of 95 percent was met for these analyses.



**Table 2. Sample cross reference list**  
**Samples collected and submitted for data validation**

Laboratory Name	Laboratory SDG	Laboratory Identification	Client Identification	Date Collected	Matrix	Analysis Requested
Test America Burlington	125196	750199	SG-8/2.8-3.3	4/24/2008	Soil Gas	VOCs
Test America Burlington	125196	750200	SG-9/2.5-3.0	4/24/2008	Soil Gas	VOCs
Test America Burlington	125196	750201	SG-10/2.5-3.0	4/24/2008	Soil Gas	VOCs
Test America Burlington	125196	750202	SG-11/2.5-3.0	4/24/2008	Soil Gas	VOCs
Test America Burlington	125196	750203	SG-12/2.5-3.0	4/25/2008	Soil Gas	VOCs
Test America Burlington	125196	7501204	DUP-1[SG-12/2.5-3.0]	4/25/2008	Soil Gas	VOCs
Test America Burlington	125196	7501205	FB-1	4/25/2008	Soil Gas	VOCs

Note:

SDG indicates sample delivery group.

VOCs indicates volatile organic compounds.

TO-14/15  
Result Summary

CLIENT SAMPLE NO.

SG-8/2.8-3.3

Lab Name: TAL Burlington

SDG Number: 125196

Dilution Factor: 2.50

Sample Matrix: AIR

Lab Sample No.: 750199

Date Analyzed: 04/30/08

Date Received: 04/26/08

Target Compound	CAS Number	Results In ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Vinyl Chloride	75-01-4	0.50	U	0.50	1.3	U	1.3
trans-1,2-Dichloroethene	156-60-5	0.50	U	0.50	2.0	U	2.0
cis-1,2-Dichloroethene	156-59-2	0.50	U	0.50	2.0	U	2.0
Trichloroethene	79-01-6	75		0.50	400		2.7

**TO-14/15  
Result Summary**

CLIENT SAMPLE NO.

SG-9/2.5-3.0

Lab Name: TAL Burlington

SDG Number: 125196

Dilution Factor: 1.00

Sample Matrix: AIR

Lab Sample No.: 750200

Date Analyzed: 05/01/08

Date Received: 04/26/08

Target Compound	CAS Number	Results In ppbv	Q	RL in ppbv	Results In ug/m3	Q	RL in ug/m3
Vinyl Chloride	75-01-4	0.20	U	0.20	0.51	U	0.51
trans-1,2-Dichloroethene	156-60-5	0.20	U	0.20	0.79	U	0.79
cis-1,2-Dichloroethene	156-59-2	0.20	U	0.20	0.79	U	0.79
Trichloroethene	79-01-6	0.31		0.20	1.7		1.1

TO-14/15  
Result Summary

CLIENT SAMPLE NO.

SG-10/2.5-3.0

Lab Name: TAL Burlington

SDG Number: 125196

Dilution Factor: 5.60

Sample Matrix: AIR

Lab Sample No.: 750201

Date Analyzed: 05/01/08

Date Received: 04/26/08

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Vinyl Chloride	75-01-4	1.1	U	1.1	2.8	U	2.8
trans-1,2-Dichloroethene	156-60-5	1.1	U	1.1	4.4	U	4.4
cis-1,2-Dichloroethene	156-59-2	1.1	U	1.1	4.4	U	4.4
Trichloroethene	79-01-6	210		1.1	1100		5.9

**TO-14/15  
Result Summary**

CLIENT SAMPLE NO.

SG-11/2.5-3.0

Lab Name: TAL Burlington

SDG Number: 125196

Dilution Factor: 1.00

Sample Matrix: AIR

Lab Sample No.: 750202

Date Analyzed: 05/01/08

Date Received: 04/26/08

Target Compound	CAS Number	Results In ppbv	Q	RL In ppbv	Results in ug/m3	Q	RL in ug/m3
Vinyl Chloride	75-01-4	0.20	U	0.20	0.51	U	0.51
trans-1,2-Dichloroethene	156-60-5	0.20	U	0.20	0.79	U	0.79
cis-1,2-Dichloroethene	156-59-2	0.20	U	0.20	0.79	U	0.79
Trichloroethene	79-01-6	8.5		0.20	46		1.1

TO-14/15  
Result Summary

CLIENT SAMPLE NO.

SG-12/2.5-3.0

Lab Name: TAL Burlington

SDG Number: 125196

Dilution Factor: 6.25

Sample Matrix: AIR

Lab Sample No.: 750203

Date Analyzed: 05/01/08

Date Received: 04/26/08

Target Compound	CAS Number	Results in ppbv	Q	RL in ppbv	Results in ug/m3	Q	RL in ug/m3
Vinyl Chloride	75-01-4	1.3	U	1.3	3.3	U	3.3
trans-1,2-Dichloroethene	156-60-5	1.3	U	1.3	5.2	U	5.2
cis-1,2-Dichloroethene	156-59-2	1.3	U	1.3	5.2	U	5.2
Trichloroethene	79-01-6	210		1.3	1100		7.0

**TO-14/15  
Result Summary**

CLIENT SAMPLE NO.

DUP-1  
SG-12/2.5.3.0

Lab Name: TAL Burlington

SDG Number: 125196

Dilution Factor: 6.06

Sample Matrix: AIR

Lab Sample No.: 750204

Date Analyzed: 05/01/08

Date Received: 04/26/08

Target Compound	CAS Number	Results In ppbv	Q	RL In ppbv	Results In ug/m3	Q	RL In ug/m3
Vinyl Chloride	75-01-4	1.2	U	1.2	3.1	U	3.1
trans-1,2-Dichloroethene	156-60-5	1.2	U	1.2	4.8	U	4.8
cis-1,2-Dichloroethene	156-59-2	1.2	U	1.2	4.8	U	4.8
Trichloroethene	79-01-6	230		1.2	1200		6.4

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TO-14/15  
Result Summary

CLIENT SAMPLE NO.

FB-1

Lab Name: TAL Burlington

SDG Number: 125196

Dilution Factor: 1.00

Sample Matrix: AIR

Lab Sample No.: 750205

Date Analyzed: 05/01/08

Date Received: 04/26/08

Target Compound	CAS Number	Results In ppbv	Q	RL In ppbv	Results In ug/m3	Q	RL In ug/m3
Vinyl Chloride	75-01-4	0.20	U	0.20	0.51	U	0.51
trans-1,2-Dichloroethene	156-60-5	0.20	U	0.20	0.79	U	0.79
cis-1,2-Dichloroethene	156-59-2	0.20	U	0.20	0.79	U	0.79
Trichloroethene	79-01-6	0.20	U	0.20	1.1	U	1.1